RISC user

November 1992
Volume 6 Issue 1
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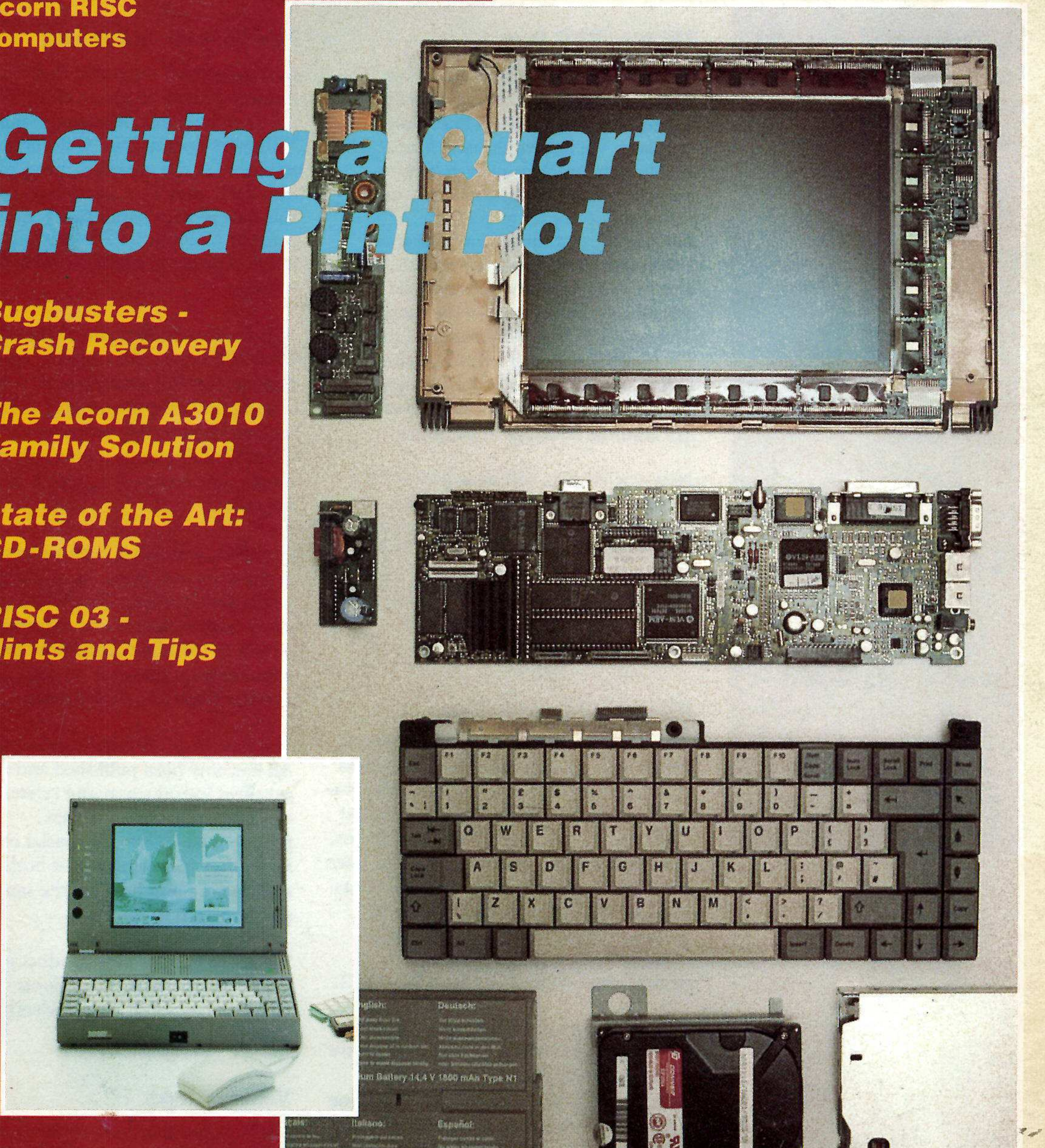
The magazine for users of Acorn RISC computers

Getting a Quart into a Pint Pot



Bugbusters - Crash Recovery

The Acorn A3010 Family Solution

State of the Art: CD-ROMS

RISC 03 - Hints and Tips

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RISC *user*

THE MAGAZINE FOR USERS OF ACORN RISC COMPUTERS

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RISC Developments Limited.

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The *New* RISC User

Welcome to the new RISC User - we hope you like the result. For information, the new page size is B5, a European standard. We believe the new format will enable us to produce an even better magazine than before, while remaining sufficiently compact to continue functioning as a convenient reference. Full colour, introduced last month, will also be used regularly from now on to enhance the appearance of the magazine. The new RISC User will continue to cater for all users of Acorn's RISC machines as before, but we hope to take advantage of the new page size to improve and extend our editorial coverage in the future.

New size binders will be available very shortly, in the same style as before, to accommodate the new size of magazine. The price will also be the same. If you already have an A5 sized binder for volume six, then you can exchange this for one of the new size by simply returning the original.

RISC User Magazine Discs

Judging by the number of subscriptions, the RISC User magazine disc is a valued item among RISC User readers. Over the years we have published many excellent applications, plus files of clip art, demos, outline fonts etc. Volume 1 of RISC User predates the introduction of RISC OS as the Archimedes' operating system (do you remember Arthur?), so magazine discs for these issues will be discontinued from 31st December 1992.

To give you some idea of the wealth of useful software which is available we are providing with this issue a complete index to all magazine discs from Volume 2 up to and including the whole of Volume 5. All of the discs listed will continue to be available for the foreseeable future, so keep this list for future reference. If you are looking for useful low cost software then look no further.

New Products - a Reminder

Last month we were able to announce a number of new products all of which are now available. Remember that the **Volume 5 Special Disc** will only be available at the member's price of £4.95 inc. VAT until 31st December. After this date it will change to its standard price of £9.95 inc. VAT at which price it still represents excellent value for money.

Can we also remind you of the update to **ChartWell** to handle negative values making it even better value than before. If you purchased the original (v1.03) version, then merely return your ChartWell disc to us (preferably with return post and packing) for a free upgrade.

DeskEdit, which has been widely praised in the computer press, has undergone major development. **DeskEdit 2** offers many improvements and extensions. Full details of DeskEdit 2 and how to upgrade from previous versions are covered elsewhere in this issue.

Our new book, **Wimp Programming for All** has now been published and offers an excellent introduction and reference on this important topic for RISC programmers. Note the special offer, to RISC User members only, if both book and disc are purchased at the same time - see the advert in this issue.

Finally, a further new product is now available, the **RISC User Fonts Disc**, which is described in the advert on page 6.

Volume 5 Index

We have produced a complete printed index to Volume 5 which is being included in the mailing of this issue. Please contact us if your copy of this (or the disc index) is missing.

L.G.C. & M.W.

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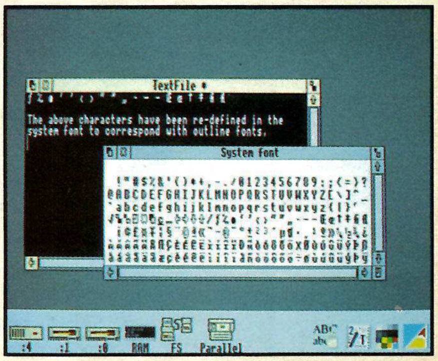

The above characters have been re-defined in the system font to correspond with outline fonts.

Extending the System Fonts

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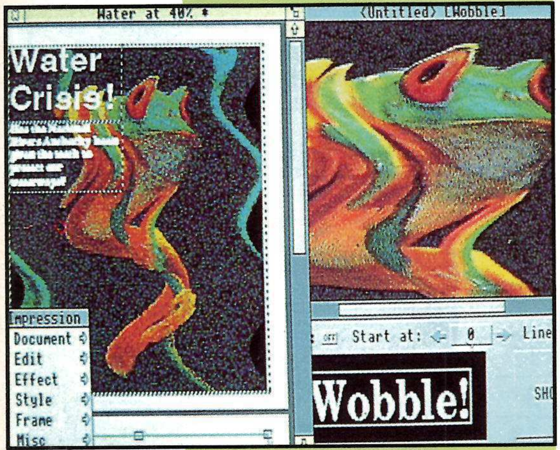
News

WHAT PRICE A NEW IMAGE?

As revealed in last month's news, Palette Studio is about to release its new RISC OS compliant art package, *Imagery*. The price has now been confirmed as £89.95 inc. VAT and p&p, even less than expected. For your money you will receive the program disc, a 64 page manual, a poster tutorial for beginners, a function key strip and a registration card. On registration, users will receive a disc full of clip art and full telephone support, a good way of getting people to return their cards.



Wobbly ribbit with Imagery

Meanwhile *Visionary*, the comprehensive image processing package also revealed last month, will hopefully be released this autumn. For more details, talk to Palette Studio at Unit 6C/6D Belgic Square, Padholme Road East, Fengate, Peterborough PE1 5XF, tel. (0733) 344245, fax (0733) 315424.

BLACK CHAOS

Matt Black (see last month's news on the new clip art library) has released its first game, called *Chaos*. There is a wonderful storyline explaining how the balance of the universe has been upset by an experiment to punch a hole in the fabric of space, but basically the game is a flashy implementation of Asteroids with multi-player options and loads of extras. If you feel you can hack it, contact Matt Black at P.O.Box 42, Peterborough, Cambridgeshire PE1 2TZ, tel. (0733) 315439 for more details.

I WISH IT COULD BE KRISALIS EVERY DAY

Krisalis Software Ltd., which has become the number one name in Archimedes games, has decided to start celebrating Christmas early with the release of four more conversions from the Amiga. The first, *Populous* is an all-time classic game in which you take the role of a Divine Being in charge of your group of followers. You must vanquish followers of the opposing religion by using various tactics such as earthquakes and floods. Hard to describe, momentous to play, Populous costs £29.99 inc. VAT and p&p. Next on the starting grid is *Lotus Turbo Challenge II*, apparently the "best driving game to date". Features include one or two player options, loads of hazards, excellent graphics and a price tag of £25.99 inc. VAT and p&p. *Omar Sharif's Bridge* is an implementation of bridge that thankfully concentrates on the game itself and doesn't contain any tacky digitised pictures of semi-naked women, and as a result the standard of play is high indeed. You can jive with Omar for £29.99 inc. VAT and p&p.

OH NO! MORE
Lemmings™
PUBLISHED & DEVELOPED ARCHIMEDES BBC A3000 BY KRISALIS SOFTWARE
OVER 100 NEW LEVELS
DATA DISK REQUIRES ORIGINAL LEMMINGS DISK
r.r.p. £19.99 inc. VAT
PSYGNOSIS

Just when you thought it was safe to jump off a cliff...

Finally, there are 100 more levels for that cult game Lemmings, cunningly titled *Oh No! More Lemmings*. You'll need the original Lemmings to play these new levels, and sleepless nights are guaranteed. The cost for this fix: £19.99 inc. VAT and p&p. Rumours from Krisalis are that it is hoping to release *Sim City* for the Archimedes in November. This cult game will work in windows in the Desktop, adding a whole new aspect to the simulation. Keep your eyes peeled for news.

Further games news is that Coin-Age (which released *Pesky Muskrats* a while ago) has announced a new game called *Gribbly's Day Out*. It's a multi-directional scrolling game with excellent graphics and a very strange story line, all for £25.99 inc. VAT and p&p. Also from the same company comes news that the programmer behind *Gods* is converting the blockbuster *Paradroid* for the Archimedes - now that *will* be worth waiting for!

Finally there's a new mega-game on the way from Dream Ltd. called *Guile*, a three dimensional space game with a plot that'll make your brain boil. Basically you are doing a spot of solar sunbathing when your Guile craft is swept away by the solar jetstream and you are dumped on a nearby planet. Here you meet a preacher who persuades you to fly around the tunnel structures inside the planet for a good cause, while you try to gain enough money to catch the Orbital Express off the planet. There are six planets in all, and the game has both arcade and adventure characteristics. The author of Guile is Andrew Martin, who wrote Supremacy for Superior Software. The game will be officially launched at the BBC Acorn User Show at the price of £29.95 inc. VAT.

For more information and therapy, contact Krisalis at Teque House, Masons Yard, Downs Row, Rotherham S60 2HD, tel. (0709) 372290, Coin-Age at 1st Floor, 23 Cooper Street, Nelson, Lancashire BB9 7XW, and Dream Ltd. at The Old School House, Alderminster, Stratford-upon-Avon CV37 8NY, tel. (0789) 450703 or (0203) 447707.

OLIVETTI WANTS TO KEEP ACORN, THANK YOU VERY MUCH

A news report in Computer Trade Weekly a couple of weeks ago rumoured that Olivetti was thinking of selling Acorn off because Olivetti was facing rather dismal financial results, and Acorn is one of its few subsidiaries making any money. However, Olivetti has strongly denied any such plans, so it looks like Acorn will be staying Italian for the time being.

On the subject of Acorn (tenuous link there!), there is an interesting point to be made with regard to the new RISC OS 3 upgrade kits. Acorn unfortunately printed the chip insertion diagram the wrong way round, and if that diagram is followed, it is quite possible that the new chip set will be blown. An erratum sheet is now supplied with each upgrade, so do make sure you take note of what it says - fried chips do *not* go down well.

With regard to the new Acorn range, supplies of A4s, RISC OS 3 upgrades and the new machines are coming in to dealers in quantity, and the A3010 Family Solution is on display in branches

AND NOW IT'S TIME FOR... CABLENEWS

CableNews has just been announced by Lingenuity. This package is a "multimedia communication package" which allows full graphical presentations to be put together using the *CableMake* application and played back using the *CableView* application. Features include compliancy with RISC OS 2 and 3, full use of outline fonts, support for sprites, Draw files and text files, mode independence, simple to use menu structures and a frame based system for creating the "slides" that make up the presentation. CableNews costs £149 ex. VAT from Lingenuity, Wood Farm, Linstead Magna, Halesworth, Suffolk IP19 0DU, tel. 098-685 477, fax 098-685 460.

OAKEY DOKEY

Oak Solutions has released four products aimed at National Curriculum History. *Ancient Egypt* and *Saxon Life* are suitable for key stage 2, while *Castle Life* and *Battle of the Somme* are for key stages 3 and 4. Each package allows children to investigate the theme using multimedia text and pictures, and there is a video disc available for Battle of the Somme which provides 35 minutes of movie and 1 hour of audio accompaniment to the package. Ancient Egypt, Saxon Life and Castle Life cost £50 ex. VAT, Battle of the Somme costs £95 ex. VAT, and the video disc for Battle of the Somme is £100 ex. VAT (or £50 if bought with the software).

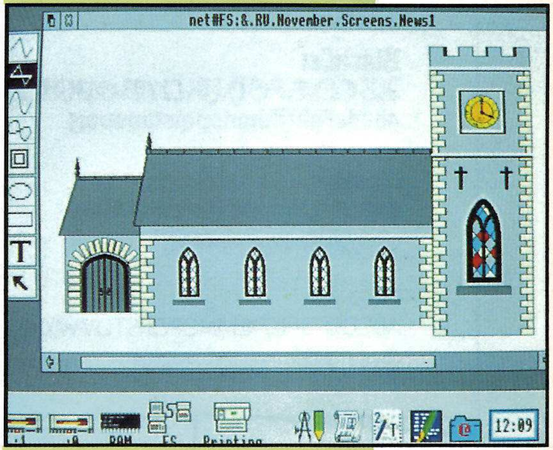
Oak has also been busy upgrading the software for its *Oak Recorder* sound sampling pack. *Sound Lab* is the new software package which allows samples to be turned into relocatable modules, and provides a real time spectrum analyser and a simple oscilloscope. In addition, sampling and playback rates can be

CRAMMING IT IN AGAIN

ArcFS, the popular data compression package (see review in RISC User 5:2) has been rewritten as *ArcFS* 2, soon to be released by Software 42. This now has a speed increase of at least 50% over version 1, and is fully compatible with RISC OS 2 and 3. There is now a professionally produced manual, and upgrades from version 1 will be available shortly. Contact Software 42 at 109 Ferry Road, Hullbridge, Hockley, Essex SS5 6EL.

ARTISTIC SOUTHERNERS?

Southern Printers has released a disc of clip art based on buildings and architecture. *Line Art Disc SP3* contains 46 highly detailed drawings covering a wide variety of building types created on the Archimedes. There is also a file containing bits of buildings to allow users to create their own designs. Discs SP1 and SP2, which cover a variety of subjects, are still available, and the prices are £5.50 for SP1 and £9 each for SP2 and SP3. These prices are fully inclusive of VAT and p&p, and the discs are only available through mail order from Southern Printers, 47 Drake Road, Willesborough, Ashford, Kent TN24 0UZ.



A Southern church

IMPACT SENDS DATABASE IN CIRCLES

Circle Software has released *Impact!*, one of the few Archimedes applications to have the exclamation mark *after* the name. Impact! is a general purpose database management program with import and export using CSV files. It is fully RISC OS compliant and is suitable for all RISC OS computers. Impact! makes use of Computer Concepts' Impulse module, allowing easy data exchange between participating Desktop applications (such as Impression). A demo disc is available for £2 inc. VAT, which is refundable on purchase. Impact! costs £49.95 from Circle Software, 33 Restrop View, Purton, Swindon SN5 9DG, tel. (0793) 770021.

RISC User **Fonts** Disc

The RISC User Fonts Disc contains ten high quality outline fonts, Acorn's outline font manager version 2.44 (for users of RISC OS 2), five applications for use with outline fonts, and a comprehensive menu system to make the disc very easy to use. All this costs just £9.95 to RISC User subscribers, representing extremely good value.

Ten Outline Fonts

As well as the ten high quality outline fonts shown below, the Fonts application also contains the complete outline font manager for RISC OS 2 - users of RISC OS 3 already have the font manager present in ROM. Full instructions on how to install the fonts onto your system are given on the disc. The ten fonts available are as follows:

Atlantis
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

Austin
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

BlackLet
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

Chancellor
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

Classroom
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

Gangster
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

Italian
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

Mercury
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

MILITARY
ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ

Wessex
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

Other Applications

The five accompanying applications are:

ShowFonts - displays outline fonts on screen and allows them to be printed out at any size for future reference
DrawFont - converts outline fonts into paths for use in Draw
FontSwap - allows easy management of multiple font directories on floppy disc systems
FontRead - downloads font definitions to PostScript printers
FontCtrl - allows fine tuning for font configuration options

The RISC User Fonts Disc costs just £9.95 inc. VAT to RISC User subscribers and £14.90 inc. VAT to non-members. Postage and packing is £1.00. Stock code PFNT.

RISC Developments Ltd, 117 Hatfield Road, St. Albans, Herts AL1 4JS
Tel: 0727 40303 Fax: 0727 860263

altered. Sound Lab is available to existing Oak Recorder owners for £14.95 ex. VAT. Contact Oak Solutions at Suite 25, Robin Enterprise Centre, Leeds Rd., Idle, West Yorkshire BD10 9TE, tel. (0274) 620423, fax (0274) 620419.

NEW SCANLIGHT FROM COMPUTER CONCEPTS

Computer Concepts is just about to release a new version of its flatbed scanner, the *ScanLight Professional*, at a new price of £595 plus £10 carriage plus VAT (£710.87 inc.). The new scanner is smaller than its predecessor, it includes updated software, costs a third less than before, and includes free on-site maintenance. The scanner is A4 sized, and is only just bigger than an A4 sheet of paper, making it one of the smallest A4 scanners around. The number of grey levels available is 256, and the maximum resolution is 1200dpi.

The scanner requires a SCSI board which is available at an extra £150 ex. VAT. Contact Computer Concepts at Gaddesden Place, Hemel Hempstead, Herts HP2 6EX, tel. (0442) 63933, fax (0442) 231632.

SUBVERSION ON CD-ROM

Browsing through Optech's latest CD-ROM catalogue makes you realise how trendy multimedia has become. There are two new CD-ROMs that will run in the native RISC OS Desktop, namely *European Business Guide* (£95 ex. VAT) and Revelation 2 (£139 ex. VAT). The first of these is "effectively an almanac on CD which contains a wealth of information for the business person" (like how to annoy people with your portable phone, presumably). The second is Longman Logotron's popular RISC OS compliant art package, along with over 65Mb of clip art and the complete collection of Magpie curriculum guides.

There are also a number of CD-ROMs which will run under the PC Emulator. These include *Microsoft Programmer's Library* (£295), *ECCTIS* (details of educational courses, £165), *PICKUP* (details of training courses), *The CIA World Factbook* (no reds under our beds for £75), *Middle East Diary* (more politics for £135), *Oxford English Dictionary (2nd Edition)* (£495), *The World Almanac* (£45), *USA Atlas* (£69.99), *The Northern Echo* (England's leading regional newspaper for £100), *RBBS in a Box (Vol. 3.1)* (PC programs from the Chicago RBBS bulletin board, £135) and finally *Shareware Gold* (£75). All prices exclude VAT and p&p.

For more details contact Optech Ltd, East Street, Farnham, Surrey GU9 7XX, tel. (0252) 714340, fax (0252) 711121. See the CD-ROM survey in this issue for details of Optech's other CD-ROMs.

DIY CD-ROM

On the subject of CD-ROMs, a company called Pressed for Time is offering to create your own CD-ROM for just £245 ex. VAT and p&p. Your CD-ROM can contain up to 600Mb of your own data, and a second copy can be pressed (if that's the right term) for an extra £50. For more details call Nik Baker at Pressed for Time, St John's Innovation Centre, Cambridge CB4 4WS, tel. (0223) 426949.

MIJAS MOVE

Mijas Software, who produces the ArcSimp simulation package (see News Volume 5 Issue 10) has changed its telephone number due to exchange modernisation. The new number is (0962) 744352.

GRAPHICAL EFFECTS

Silica Software has announced details of *Fx2*, release two of its Fx graph drawing application. The new version is RISC OS compliant and contains support for Draw file output and printing via the printer drivers. Outline fonts are used for labelling axes, and almost any equation can be entered and plotted. Polar and Cartesian graphs are supported, in both normal and parametric forms. Variables in graphs can be altered to plot families of curves, and graph editing can be performed before saving to Draw. There are also a number of processing functions that can be applied to graphs, such as integration, differentiation and finding roots. Fx2 costs £59.95, including a site licence for up to 20 machines. Contact Silica Software Systems at Mallards, Lower Hardres, Canterbury, Kent CT4 5NU, tel. (0227) 70279.

HIGH RESOLUTIONS FOR CALLIGRAPH

Calligraph Ltd. of Cambridge has just released details of its latest direct drive printer. The 600-12 uses a Qume Express engine, which is a 300dpi printer overdriven to 600dpi (like Computer Concepts' LaserDirect HiRes). Resolutions available are 300dpi, 400dpi, 600dpi and 800dpi (1200dpi is available, but the quality tends to break up at this resolution). The printer is very fast at 12 pages per minute (i.e. 5 seconds per page) with dual paper bins. The choice of bin can be made from the Desktop, allowing flexible use of different paper types over a network. The printer costs £1399 ex. VAT (£1299 ex. VAT to education), and this includes the expansion card and driver software. Calligraph recommends that users have 4Mb in their machines to enable the driver software to work properly. Contact Calligraph at 53 Panton Street, Cambridge CB2 1HL, tel. (0233) 461143, fax (0223) 316144.

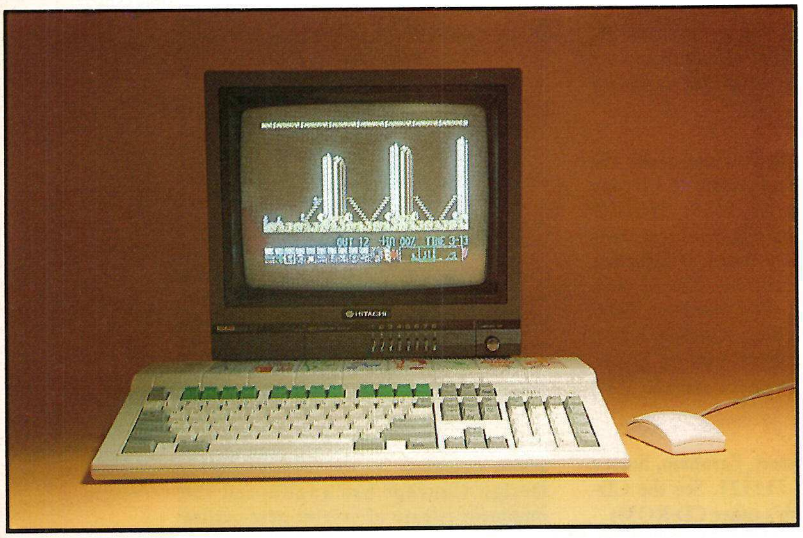
DESIGN CONCEPT RELEASE NEW FONTS

Design Concept has announced the imminent release of several new outline fonts for the Arc. The prices are just £4 for the first font in a family and £3 for each subsequent member, so a family of four fonts would cost £13. These prices include a site licence, and carriage is £2 extra. The new fonts include *Mario Open* (a classic serif font), *Foundation* (an educational font) and *Matrix35* (a font based on LED display matrices). Updated fonts include *Ainslie, Celtic, Copperplate, Scrawl, Katiyo* and *Chinese* (the latter two have been bought from RISC User). Design Concept is at 30 South Oswald Road, Edinburgh EH9 2HG, tel. 031-668 2000.

The Acorn A3010 Family Solution

Mark Moxon follows up last month's article and has a look at the new A3010 package and dreams of happy families.

The first thing that hits you about the new Acorn A3010 is that it looks much nicer than its predecessor, the A3000. The shaping of the computer is much more aerodynamic (for want of a better word), the case is not so deep, and the function keys are now in mellow Acorn green, rather than garish BBC red. The case is also no longer the usual cream, but is "warm grey", and I must say I like it. This, you think, would look nice in your home.



The A3010 playing Lemmings on a normal TV

The A3010 Family Solution (£499 inc. VAT), which I will look at in this review, is aimed squarely at the consumer market, and is being sold through the high street shops in an attempt to capture some of the Christmas market. On the other hand, the more expensive A3010 Learning Curve (£799 inc. VAT) is aimed at the same market as the A3000 Learning Curve. As is usually the case, Acorn have come up with an excellent computer at an excellent price, but that's been said before many times. So what is so exciting about this new machine that makes it worth considering?

THE HARD FACTS

The A3010 comes with a host of goodies. Apart from the machine itself there is a mouse, a co-axial lead for connection to a TV, a high density Applications disc, a Support disc, two audio tapes, three manuals, two blank TDK high density discs, and a rather colourful sticker attached to the top of the machine. This can be detached, depending on how loud you want your computer to look.

First of all, let's consider the machine itself. The facts are simple. The A3010 uses an ARM250 RISC processor to deliver a high speed machine, running the RISC OS 3.10 operating system. The machine comes with 1Mb of RAM, upgradable to 2Mb, and has a high density 2Mb floppy disc drive built in to the right-hand side of the case (the same position as on the A3000). The mouse provided is the same as for the recently launched A4, and it has a sleek sloping design which is much more comfortable than the previous Acorn mouse. The mouse is also coloured warm grey to match the case.

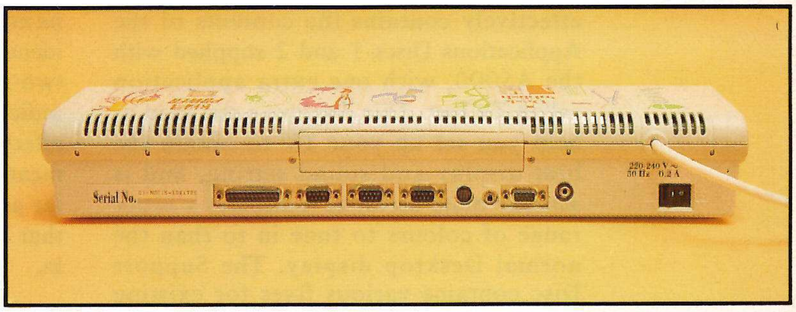
On the back of the computer are a TV modulator socket, two joystick ports, a monitor socket (15 pin, as on the A5000), a headphone output, serial and parallel ports and the power switch. The mouse connector is also on the back of the case, which is far more convenient than the socket under the A3000, and there's a removable flap at the back where one mini expansion card will fit (the same cards that fit the A3000 will fit the A3010).

WHAT'S NEW, PUSSYCAT?

Physically, therefore, the A3010 represents an improvement on the A3000 in a number of ways. However, I found that the newly designed disc drive button, which is now almost flush with the case, was rather hard to locate without looking. Another personal niggle was that the reset button, which is now on the left-hand side of the case to prevent confusion with the disc drive button, is inset into the computer casing, so it can only be pressed using a pen or similar. This design feature is intentional, and of course Ctrl-Break can still be used to reset the machine in most cases, but what use is a button which is so hard to press that most users will opt for simply switching the machine off and on? The official line is that then kids won't accidentally press it, but I still think it is a little too hard to press.

The new TV modulator socket on the back means that the computer can be hooked up to a normal TV screen using the cable provided, avoiding the need for expensive dedicated monitors. When I connected the A3010 to my TV the screen display was certainly usable, but compared to a dedicated monitor the colours crawled and the definition was rather patchy. Small anti-aliased text was hard to read, yellows and creams seemed to be quite similar (both being close to normal yellow) and I felt that using the computer for long periods of time would make my eyes pop out. However, comparing the picture to that produced by an Amiga (for which you would need to buy a separate TV modulator) or a BBC micro showed that the output was not that bad in comparison, and the picture *is* dependent on the quality of your TV more than the computer. The display is perfectly adequate for playing games, but is not quite up to detailed DTP work; of course you can buy a monitor and plug that in any time. An unexpected bonus of the TV output is that the sound is put through your TV speaker, enabling you to annoy the neighbours with no problems.

The two joystick ports will take standard Atari-style 9-pin joysticks. The two ports are controlled by the operating system via a module called 'Joystick', which provides a system call to read the state of the joysticks. For the techno-hungry among you, this is SWI number &43F40, called "Joystick_Read", which simply returns a 5-bit number describing the state of the joystick port specified. This means that existing games will not take any notice of the joystick port, as they need specific code to read the joysticks. Quest for Gold, which is provided with the Family Solution (see below) makes use of the joysticks, as do most recent games. One small niggle is that the joystick ports are not numbered on the computer's case, but that's not a major problem.



The rear of the A3010. If you look closely you can see the rather colourful sticker Acorn so thoughtfully provide

There are a couple of other interesting points about the hardware side of the A3010. There is only one speaker, fitted under the right-hand side of the keyboard, so the sound output from the machine itself is not in stereo (unlike the A3000). However, the A3010 does support full stereo sound, and connecting the headphone socket to a stereo monitor (such as the standard Acorn monitor) enables stereo sound to be produced; and because plugging a jack into the headphone socket now turns off the computer's internal speaker, the sound is genuinely stereo.

The other useful point is that the A3010's disc drive can detect if there is a disc in the drive, so if the computer asks for a certain disc, you don't need to bother to click on OK when you have inserted it. This feature, present on the A5000 and the A4, was not available on the A400 series, and it is most useful.

USING RISC OS 3.10

So, what is it like using the new machine? Well, RISC OS 3.10 has been speeded up over its predecessor, version 3.00, and now the time taken for the machine to boot up from scratch is only just over 10 seconds. The familiar RISC OS Desktop then appears, with a total of 584K of free memory available (with 160K more allocated to the font cache). Alarm, Calc, Chars, Configure, Draw, Edit, Help and Paint are all available in ROM, and all load almost instantly without having to insert a disc into the drive. Thus the computer can be used to produce text and graphics without having to load anything externally.

The high density Applications disc effectively contains the contents of the Applications Discs 1 and 2 supplied with the A5000, with one extra application called TVTest. This displays a test card to help you set up your TV to obtain the best display and sound setting, and is actually quite useful as it displays a better range of colours to tune in to than the normal Desktop display. The Support Disc contains various fixes for existing RISC OS software to enable it to work on the A3010, as well as a few applications aimed at integrating RISC OS into the outside world. The most useful of these is T1ToFont which converts fonts in Adobe(TM) Type 1 format to the RISC OS font file format, allowing these fonts to be used by the RISC OS font manager - very handy if you already have some Adobe(TM) fonts about the place. The conversion is made all the more simple because RISC OS can read DOS discs directly, displaying the files in a normal Filer window.

The A3010 comes with three manuals in all, namely the A3010 Welcome Guide, the RISC OS 3 User/Applications Guide, and the RISC OS 3.10 Release Notes. The Welcome Guide describes how to set up the machine, and introduces concepts such as the mouse, windows, discs and printers to those who are new to computing. As with other Acorn Welcome Guides it is well written, and provides a gentle explanation without getting weighed down with too much jargon. The latter part of the Guide contains details of the A3010 hardware, as the other manuals provided are concerned with the RISC OS operating system, which is generic to all Acorn computers. There is handy information on tuning your TV for use with the A3010, and lots of diagrams of the ports on the back.

The User and Applications Guides have been combined into one volume (they are supplied as two separate books with the A5000), bound in normal paperback style rather than the more usual ring bound style. This is not as inconvenient as you might think, although it would be nice to be able to leave the Guide open next to the computer. The text is identical to the A5000 manuals, and the two parts even have separate numbering, indicating that the original manuals have effectively been glued together. This does mean that there are a few omissions as far as new features of RISC OS 3.10, but that is where the third "manual" comes in.

The RISC OS 3.10 Release Notes contain details for those upgrading from RISC OS 2 or 3.00, as well as amendments and additions to the other manuals supplied. The only differences documented between versions 3.00 and 3.10 are some changes to the printer drivers, but of course a large number of bugs have been fixed between the two versions. An interesting addendum to the Release Notes describes a recurrence of the ADFSDirCache bug, present in RISC OS 3.00, removed in RISC OS 3.01 and welcomed back for 1Mb machines in RISC OS 3.10. Whoops!

Finally there are two audio tapes that come with the machine. These form an introduction to using the RISC OS Desktop, and should be most useful to complete beginners. However, the voice of a man going at a certain pace with no illustrations to hand does seem harder to follow than a very well written manual with lots of illustrations - that's just my personal opinion, but with a manual you can go at your own pace, easily re-read passages and study pictures, all of which are not possible with a tape. On the other hand, the tapes are supposed to complement the manuals, and as a result they do a good job.

ENTER THE FAMILY SOLUTION

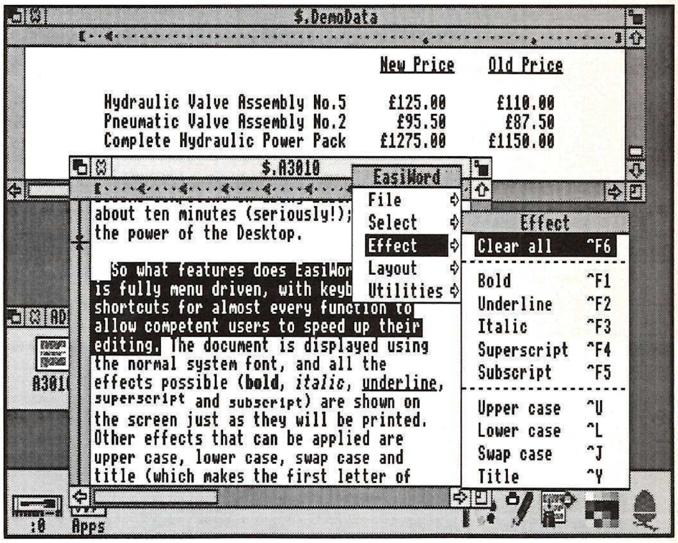
The A3010 Family Solution, which is the cheapest way of buying an A3010, costs only £499 inc. VAT - compare that with an 8-bit Master 128 which retails at £399 ex. VAT and doesn't have a disc drive, a mouse or anything like RISC OS. The package consists of the A3010 computer, Minerva Software's EasiWord word processor and a game, which at the moment is Krisalis' Quest for Gold, the Olympic games simulation, but it is understood that a different game will be included nearer Christmas.

EASIWORD

EasiWord was first reviewed in RISC User Volume 4 Issue 7, when it cost £40 inc. VAT and was thought to be good and cheap, but seriously lacking in features. Nowadays it can be picked up for around £22 inc. VAT, so it doesn't pretend to be a very sophisticated desktop publisher or anything like that. I had never used EasiWord before trying the Family Solution, and I have to say that the new version supplied with the Family Solution is one of the most delightful pieces of software I have ever used.

EasiWord is simply a word processor, nothing more, nothing less. It has replaced the dated 1st Word Plus as the word processor supplied with Acorn machines, and I must say I'm very relieved. 1st Word Plus is a sophisticated product with features such as mail merge, but it's not renowned for its usability and flexibility - for example, it doesn't print via the RISC OS printer drivers and isn't quite RISC OS compliant in all areas. That's why I'm pleased: EasiWord is not as feature packed as 1st Word Plus, but it contains all the necessary functions for the type of word processing purchasers of the A3010 will want to do, and it is completely RISC OS compliant. This last point is more important than you may think, as it meant that I was able to become competent in using EasiWord in about ten minutes (seriously!); such is the power of the Desktop.

So what features does EasiWord boast? It is fully menu driven, with keyboard shortcuts for almost every function to allow competent users to speed up their editing. The document is displayed using the normal system font, and all the effects possible (bold, italic, underline, superscript and subscript) are shown on the screen just as they will be printed. Other effects that can be applied are upper case, lower case, swap case and title (which makes the first letter of each word a capital, and the rest lower case).



	New Price	Old Price
Hydraulic Valve Assembly No.5	£125.00	£110.00
Pneumatic Valve Assembly No.2	£95.50	£87.50
Complete Hydraulic Power Pack	£1275.00	£1150.00

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the power of the Desktop.

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title (which makes the first letter of

EasiWord in action

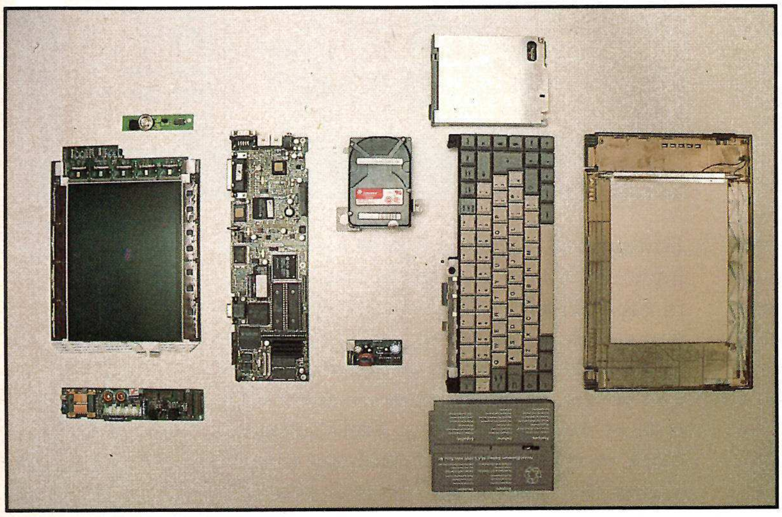
Editing and entering text is simple and intuitive. A very nice touch (one of many in the package) allows the block editing commands to be set up either to follow Edit's style (e.g. Ctrl-C copies a block of text to the caret) or the more usual DTP style of the clipboard (e.g. Ctrl-C copies a block of text to the clipboard and doesn't change the document). This is an excellent idea: the manual suggests that if you are new to RISC OS, you should learn to use the clipboard, and with this I fully concur. There is also an option to allow the

Continued on page 15

Getting a Quart into a Pint Pot

The story behind the creation of the A4 by Acorn's Tim Caspell.

One of the most commercially dynamic and rapidly expanding markets in recent years in personal computing has been for portable computers which have comparable functionality to their more familiar desktop counterparts. This market is now maturing and broadening to include classes of much smaller portable equipment with varying degrees of reduced functionality. In the fullness of time, it is likely that the current class distinction between laptop, notebook and palmtop systems will blur from perception - this wide category of intrinsically portable processing power will probably displace most small desktop systems (mains-powered, not easily portable), and the smallest mains dependent machines will be what we today classify as workstations.



An exploded A4

It was against the predictions of this backdrop and a growing awareness in our market areas that in 1990 Acorn decided the time was right to start work on a range of portable computer solutions. The Acorn A4, launched in July of this year, represents our first introduction in this field. This article summarises our technical activities from the decision to proceed through to finished product - a path which was unarguably long with the odd unexpected twist, sometimes rocky, rarely smooth, but never dull to follow.

THE DESIGN STAGE

In the beginning, we approached our traditional customer base, to ask them what facilities and general capability they required. The response varied, more even than it usually does, from intelligent and realistic priority ranking of features to sweeping requests for everything at a giveaway price. Based on these initial findings and our own market and feasibility study conclusions, we decided that the best balance would be achieved with a notebook class system, defined at the time as a near-full functionality system with an approximate A4 paper-size footprint weighing less than 5kg all up. Agreement on some of the details, such as cost vs ARM2 or ARM3, and battery life vs screen backlighter, were deferred until later in the design process, so that market positioning and competitive analysis would be more accurate.

The challenge was then to develop from the current Acorn Archimedes and RISC OS 2 design and functionality to produce a machine and operating system with more performance and storage and some additional interfaces, in a base enclosure with a volume only about one sixth that of the Archimedes base unit - and what's more, the portable also had to contain a large battery pack and an internal keyboard which together occupy one third of the total volume, leaving even less space for the rest of the system. Less a quart in a pint pot, more like a gallon.

THE BIG SQUEEZE

The technical design process involved a number of trade-offs and decisions.

Having accepted that the internal expansion capabilities of the portable would be severely limited by space, thermal and power constraints, we examined each remaining functional block of the design to decide how and whether it would be implemented, as power consumption, space requirements, cost and functionality were often in conflict. At the same time, we considered how best to provide the enclosure and liquid crystal display (LCD) screen; should we design and tool our own from scratch (a very expensive undertaking to deliver a good quality robust case), or should we use a commercially available OEM design with very high per-unit costs and royalties?

We decided to utilise the enclosure and several other parts of the notebook PC range then being developed by Triumph Adler in Germany, a sister company within the Olivetti group, as this route offered us a much reduced initial start-up cost and increased the utilisation of tooling which was already being paid for within the group. This selection gave rise to a number of trips to Triumph Adler's design and manufacturing facilities in Nurnberg and elsewhere, and led (eventually) to the necessary understanding of their design - I still have a piece of the Berlin Wall on my desk, collected on a trip, which I tell visitors is symbolic of my personal struggle to comprehend their drawing system!

The overall circuit design work continued; the peripheral input/output (I/O) world was rationalised and much reduced in component count by using a combo I/O controller often used in the PC design world, which also includes hardware support for high density floppy discs, an integrated drive electronics (IDE) hard disc interface and a bi-directional parallel port - all necessary attributes in this new range.

This meant that the interface between the ARM I/O controller (IOC) and the revised I/O world became more complex, and the necessary logic would have taken too much room (and cost too much) if implemented in discrete components, so the design of an application specific integrated circuit (ASIC) called IOEB (for I/O Extension) was specified to integrate these *glue* functions.

The sound system was redesigned, as the previous passive filter arrangement consumes far too much power, particularly when the sound system is silent. To further reduce the power consumption when the machine is idling, a clock divider system is included which monitors the ratio of Wimp idle events (the Wimp is the part of RISC OS which provides the Desktop and manages all the applications and other tasks which run on the computer), so that the processor and memory clock rates could be reduced to save power when not actively processing. The discrete video interface circuitry was integrated onto a single-in-line (SIL) hybrid device which is mounted on edge on the main printed circuit board (PCB) to reduce the area used.

BATTERY AND LCD

A separate dedicated micro-controller battery management unit (BMU) system was designed to monitor and control the state of the rechargeable battery pack and regulate the external mains adaptor to ensure safe recharging; the BMU also monitors discharge rates, and in conjunction with the RISC OS battery manager application provides an indication of the charge state as well as driving the separate battery charge status indicator on the front of the unit. A *5th column* read-only memory (ROM) is also included in the design for loading the additional software modules required by the portable design.

In addition to earlier Acorn system functionality, a new interface was required on the portable to drive the LCD panel; a more complicated task than it would at first appear, as this interface also has to provide the hardware greyscaling control and to buffer parts of the frame display. This is required because the LCD panel used is actually constructed from two panels 640 pixels wide by 240 pixels high to make 640 by 480 in total, each half-panel being vertically scanned simultaneously. A second ASIC called LC was specified to perform these and some ancillary functions, and it incorporates Acorn's unique greyscaling approach for which UK and US patent applications have been filed.

THE FIRST MOCK-UP

The first implementation of the design was made by building a software development board, large enough to try out certain options (it had both ARM2 and ARM3 footprints on it), with connection points where discrete circuit models - and later the ASIC test boards - could be plugged into the design. This software development board was used by the RISC OS team to develop RISC OS 3, including new device drivers for the new I/O world. It was also used directly as the basis of the Acorn A5000 board, and the architectural similarity between the A5000 and the A4 is a direct result of their common design base; in fact, it could be said that the A5000 is a desktop implementation of the portable rather than the Acorn A4 being a portable A5000.

There are those who would say that we had fun with the design of the ASICs, but it is also a fact that this major portion of the development took much longer than we had anticipated. We worked in close partnership with the ASIC manufacturer, using the software modelling and integration tools they supplied, so that the finished design could be both parametrically and functionally modelled in detail and then fed directly into their *silicon compiler*. However, we found their development tools had a number of bugs and inconsistencies, and the all-important documentation left much to be desired. Several changes to the tools and some mentally agile interpretation of the manuals (and a bigger and faster workstation) were required before the job could be completed, but it must be said that the UK engineers and others at the ASIC manufacturer who supported us worked extremely hard on our behalf on many occasions, and we are grateful for their assistance.

A hardware prototype of the IOEB ASIC was built using programmable array logic (PALs) and discrete logic, and was plugged into the software development board so that the logical design could be validated before committing to silicon (and the RISC OS device drivers, which interface the hardware devices to the filing systems in the operating system, could be tested). It was simply not practical in circuit terms to do the same for the LC ASIC so this, the more complicated of the two ASICs, relied on software modelling alone to prove the design. This approach meant that when the first samples were received, a few extremely nervous minutes passed whilst we plugged it all together to see if it worked in real life. It is to the credit of all the designers concerned that, despite the numerous problems with the tools provided, their meticulous attention to detail resulted in ASIC designs which both worked straight away and were "right first time".

PUTTING IT ALL TOGETHER

After some debate, ARM3 was chosen as the processor, as it was felt to have a more significant positive effect on performance, and thus market acceptance, than the resultant negative effect on the price; and in addition the on-chip cache significantly reduces the frequency of accesses to the main random access memory (RAM), a technique which further reduces the overall power consumption.

The use of a backlight for the LCD display was agreed as a necessary feature, even though it represents a significant drain on the battery when on full brightness. Strictly, it is an edgelight; a slim fluorescent tube along one edge of the LCD, with the light diffused evenly over the display area through a graduated light dispersion guide.

Work on completing the main PCB design continued in parallel with the ASIC development, and the tricky task of tracking the finished board - which has many additional layout and headroom constraints over and above those normally encountered when tracking our type of boards - resulted in a ten layer PCB with densely packed surface mounted components on both faces of the board. The main PCB total surface area is less than one third that of the Archimedes equivalent, even though it includes several extra functional blocks.

The first fully assembled and working prototype unit was completed at the end of 1991, and two units were discreetly shown to select audiences at the 1992 BETT show in January, where the machine was very well received. Testing and proving of the design continued alongside the completion and major audit of RISC OS 3.10. The hardware and software manuals, supporting documentation, packaging design and manufacturing drawings were prepared and released in stages to the manufacturing site.

Our marketeers began writing brochures and letters in all directions, and many others in Acorn bowed in and out to play their part in the hundreds of other tasks necessary to complete the design, development, manufacturing start-up, launch and product introduction to a distinctly expectant world. The first full production A4 from the manufacturing site was received on 19th June, 11 days ahead of our revised forecast date. Weighing in at just a whisker over 3kg, small and perfectly formed, it's doing just fine, and its order book is growing steadily; after many thousands of person-hours in labour, its *parents* are still recovering!

The Acorn A3010 Family Solution

(continued from page 11)

common DTP feature that selecting a block and typing will delete that block and replace it with what you typed. Understandably this can confuse users who are not expecting this to happen, so the feature can be turned off.

Text rulers can easily be edited and created, using one of the best methods I have ever seen - you simply double-click with the mouse on the ruler to insert a tab, and double-clicking with Adjust cycles this tab through the four types (left, right, centred and decimal). Right and left margins can be altered simply by dragging them, and the strip down the left-hand side of the window can be made to show the scope of each ruler in the text in a graphical form.

Other features of EasiWord are: a 50,000 word spelling checker (including an option to check as you type and user dictionaries), the ability to save files in 1st Word Plus or ASCII text format, very easy page layout editing, headers and footers, comprehensive find and replace, a fast Goto function, multiple views on documents, and a host of useful little options. The manual is excellent, and is very easy to follow, even for complete beginners.

CONCLUSION

As you can see from my enthusiasm, I think the A3010 Family Solution is excellent. Now it's up to Acorn to sell the machine, and sell it they must. It's available in the high street stores, but that's not the end of the story; in high street stores it's the blind selling to the blind, and there's always the worry that sales staff will feel more confident selling machines like PCs with which they are more familiar, but which are totally unsuitable for family computing. The A3010 deserves to win hands down, but the question is, will it? Only time will tell.

NEW

Archimedes Software

Gives you room to expand!

SparkFS

SparkFS is a new compressed filing system that lets you fit more on your discs. Programs work as normal, but files take up less space.

- Files can be stored individually not in easy to damage archives and there are no confusing duplicate disc drive icons to master.
- Reads ARJ, ArcFS, SEA/PKarc, PackdDir, Spark, Zoo, Zip, LZH, Tar, Packit, Stuffit and Compactor archive files.
- Writes SEA/PKarc, Tar, Zip and Spark archive files. Zip files can be used on other machines and retain attributes.
- Modular design means you only need to load pieces you want. Scrap files can be in RAM or on disc and won't fragment memory
- DES data encryption to password protect your files. Supports UUcode, HQX, AtoB, FCET, Boo and UNIX Compress
- Completely transparent access to files. Extensive range of powerful data compression algorithms.

SparkFS with manual and case is £23.96 inclusive.

(Upgrades, owners of Spark and ArcFS, can deduct £5.99 each)

NEW

ArcFAX - Class 2 Fax modem package

Allows sending and receiving faxes from the desktop using a suitable Fax modem. Received faxes can be saved as sprites. Faxes are sent by printing in the usual way. Script language, telephone directory, scheduling, received image processing.

ArcFAX with manual and case £23.96

NEW

Disc 2 - MicroSpell 3.XX New Desktop Spell checker

Provides all the features possible in a stand alone spelling checker. Check files, check text in icons, continuous spell check whilst you type, display and correct last error. Edit dictionary. Multiple dictionaries. Supplied with 200,000 words. Fast. Foresight mode, displays closest match in dictionary to word being typed and allows completion with a key press or mouse click. Good for poor typists.

(Upgrades, owners of MicroSpell 1.XX and 2.XX can upgrade for free)

Disc 35 Trace/D2Font - Make your own fonts

Trace is a program for converting Sprites into Draw files. D2Font, takes Draw files and produces outline fonts suitable for use with Draw and DTP programs. Trace and D2Font allow anyone with a scanner to make their own fonts from printed examples. Examples of Trace and D2Font included.

Discs are £5.99 each, all inclusive.

David Pilling, P.O. Box 22, Thornton Cleveleys, Blackpool. FY5 1LR.

Free Air Mail delivery on overseas orders. Extensive range of other Archimedes software available (programmers tools, games, utilities, clip art), please send for free list.

Bugbuster - Crash Recovery

Are your programs plagued by bugs? Help is at hand with this utility from David Spencer.

There is nothing more irritating than having an application crash in a non-recoverable loop. Not only do you have to reset the computer, but if you are working in the Desktop, then the chances are that you will lose data from other applications. This problem is worse when developing programs as it is almost impossible to safeguard against all likely sources of a crash.

The *BugBuster* module presented here provides two separate functions to help remedy the problem of crashes. Firstly, it prevents programs running in the ARM's user mode (i.e most applications) from writing to memory locations in the range 0 to &8000. These locations are reserved for RISC OS itself and contain some rather sensitive values. In particular, the bottom few bytes hold the hardware vectors used for SWI calls and the like. If these get overwritten then a total crash is inevitable. Unfortunately, it is all too easy to write to these locations by failing to initialise pointer variables. This can happen in Basic, C and Assembler alike. For example, try using Basic's Assembler without setting up P% first. With *BugBuster* installed any attempt to write to memory in the range 0 to &8000 will cause an 'Abort on data transfer error' - still not very friendly but better than a total crash!

The second function of *BugBuster* is to provide a 'get out' mechanism for programs that are trapped in a loop. Such loops can occur directly as a result of coding errors, particularly with Wimp programs as the Escape key is disabled whilst they are running. However, a much more subtle looping occurs when a window's redraw code generates an error. The Wimp faithfully reports this error by putting up a box that probably covers the window that was being redrawn. When the user clicks on 'OK' the Wimp removes the error box and tries to redraw the window again. Assuming the error condition is still present, another error will occur and the whole machine is stuck in an infuriating loop.

BugBuster allows you to get out of either of these loop states by holding down the three keys Ctrl-Alt-Copy. The offending application will be killed with an error, but you will be able to recover control of the system, including any other applications that are also running.

USING BUGBUSTER

Type in and run the Basic listing given below. This will create and save a module called "BugBuster" in the current directory which can be loaded by double clicking on it. Once loaded, the Ctrl-Alt-Copy abort sequence will be active, but don't use it until you've read the warning below. The memory protection is also enabled, although this can be disabled if needed by using the command:

```
*UnProtect
```

This will be required if a program has a legitimate reason for writing to low memory. The protection can be re-enabled using the command:

```
*Protect
```

You can check that the module is active by looking for the name "BugBuster" in the list produced by *Modules. You can remove the module at any time by using the command:

```
*RMKill BugBuster
```

RESTRICTIONS

BugBuster will let you recover from most situations, although there are some limitations. Firstly, the memory protection cannot help misbehaved programs that run in supervisor mode, such as system extension modules. Similarly, the abort function cannot work if an application has disabled interrupts or corrupted things so badly that no recovery is possible.

Also, the Ctrl-Alt-Copy sequence should only be used when a crash has occurred, otherwise you might kill off a task unintentionally. This is particularly true in the Desktop, where the tasks are switched in one after the other. In this case, if Ctrl-Alt-Copy is used repeatedly in a non-crash situation, each active task is killed off one by one until none are left and the Desktop quits.

HOW IT WORKS

The two functions of BugBuster are essentially self contained. The memory protection is performed by reprogramming the memory mapping in the memory controller, MEMC, to prevent write accesses in user mode. This is done by searching for the memory page that is mapped to address zero, changing its protection state and writing it back. There is a minor complication in that if an error is about to be reported to the default error handler, the protection has to be suspended. This is because the error handler legitimately writes in user mode to a location that would be protected. In this case, the protection state is restored when a new application is started.

The 'bail out' function installs an event handler that is called each time a key is pressed or released. This checks for the appropriate key presses and if all three keys are down (having previously all been up), it installs a callback routine before returning. RISC OS will execute the callback routine as soon as it is safe to do so. The effect os the callback code is to issue an UpCall to the current application to indicate that another application wants to take over and then to generate an error. Assuming that the original application is reasonably behaved, it should die gracefully and the error will be reported.

This month's magazine disc contains an enhanced version of *BugBuster* which detects when an 'Abort on data transfer' has been caused by an access violation to low memory and reports it as a more friendly error message, including the instruction that failed, and the address it was trying to access.

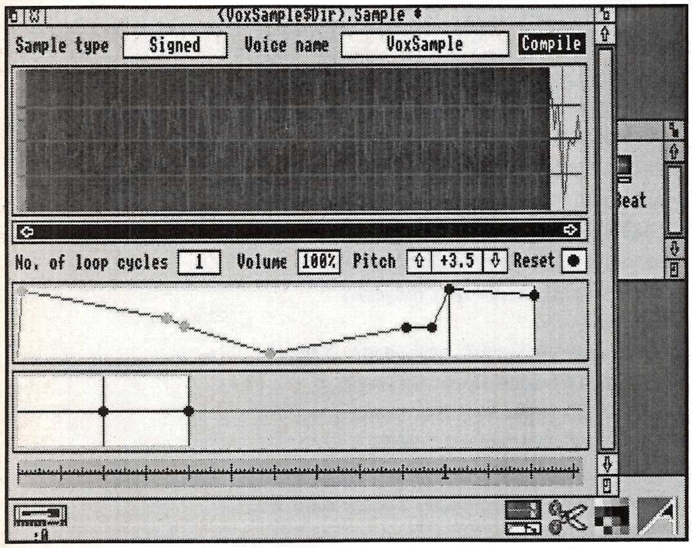
```
 10 REM          >Buster
 20 REM Program   Bug Buster Module
 30 REM Version   A1.00
 40 REM Author    David Spencer
 50 REM RISC User November 1992
 60 REM Program   Subject to Copyright
 70 :
 80 keys=0:goal=1:oldstate=2:pstate=3
 90 deferr=4:temp=8
100 :
110 DIM code 1000
120 FOR pass = 0 TO 3 STEP 3
130 P%=0:O%=code
140 [OPT pass + 4
150 EQUD 0:EQUD init:EQUD final
160 EQUD service:EQUD title
170 EQUD help:EQUD commtab
180 :
190 .title
200 EQUS "BugBuster":EQUB 0
210 .help EQUS "Bug Buster":EQUB 9
220 EQUS "1.00 (06 Sep 1992)":EQUB 0
230 :
240 .init STMFD R13!,{R14}:MOV R0,#6
250 MOV R3,#64:SWI "XOS_Module"
260 LDMVSFD R13!,{PC}:STR R2,[R12]
270 MOV R12,R2:BL setup:BL protect
280 LDMFD R13!,{PC}^
290 :
300 .final STMFD R13!,{R14}
310 LDR R12,[R12]
320 BL unprotect:MOV R0,#13
330 MOV R1,#11:SWI "XOS_Byte"
340 MOV R0,#&10:ADR R1,event
350 MOV R2,R12:SWI "XOS_Release"
360 LDMFD R13!,{PC}^
370 :
380 .service STMFD R13!,{R0-R5,R14}
390 LDR R12,[R12]
400 TEQ R1,#&2A:BNE service2
410 LDRB R0,[R12,#oldstate]
420 TEQ R0,#1:BLEQ protect
430 MVN R0,#0:STRB R0,[R12,#oldstate]
440 LDMFD R13!,{R0-R5,PC}^
450 .service2 TEQ R1,#6:BLEQ error
460 LDMEQFD R13!,{R0-R5,PC}^
470 TEQ R1,#&27:BLEQ setup
480 BLEQ protect
490 LDMFD R13!,{R0-R5,PC}^
500 :
510 .setup STMFD R13!,{R14}
520 MOV R0,#0:STRB R0,[R12,#keys]
530 MOV R0,#7:STRB R0,[R12,#goal]
540 MOV R0,#&10
550 ADR R1,event:MOV R2,R12
560 SWI "XOS_Claim":MOV R0,#14
570 MOV R1,#11:SWI "XOS_Byte"
580 MOV R0,#6
590 SWI "XOS_ReadDefaultHandler"
600 STR R1,[R12,#deferr]
610 MVN R0,#0:STRB R0,[R12,#oldstate]
620 LDMFD R13!,{PC}^
630 :
640 .error STMFD R13!,{R14}
650 MOV R0,#6:MOV R1,#0:MOV R2,#0
660 MOV R3,#0
670 SWI "XOS_ChangeEnvironment"
680 LDR R0,[R12,#deferr]:TEQ R0,R1
690 LDREQB R0,[R12,#pstate]
700 STREQB R0,[R12,#oldstate]
710 BLEQ unprotect
720 LDMFD R13!,{PC}^
730 :
740 .event TEQ R0,#11:MOVNES PC,R14
750 STMFD R13!,{R0-R3,R14}
760 MOV R3,#0
770 LDRB R0,[R12,#keys]:TEQ R2,#&3B
780 TEQNE R2,#&61:MOVEQ R3,#1
790 TEQ R2,#&5E:TEQNE R2,#&60
800 MOVEQ R3,#2:TEQ R2,#&35
810 TEQNE R2,#&67:MOVEQ R3,#4
820 TEQ R1,#0:BICEQ R0,R0,R3
830 ORRNE R0,R0,R3
840 STRB R0,[R12,#keys]
850 LDRB R1,[R12,#goal]:TEQ R0,R1
860 LDMNEFD R13!,{R0-R3,PC}^
870 TEQ R0,#%111:BLEQ getout
880 EOR R1,R1,#7:STRB R1,[R12,#goal]
890 LDMFD R13!,{R0-R3,PC}^
900 :
910 .getout STMFD R13!,{R0-R3,R14}
920 ADR R0,callback:MOV R1,R12
930 SWI "XOS_AddCallBack"
940 LDMFD R13!,{R0-R3,PC}^
950 :
960 .callback MOV R0,#256
970 SWI "XOS_UpCall":ADR R0,outerror
980 SWI "OS_GenerateError"
990 :
1000 .outerror EQUD 0
1010 EQUS "Task terminated":EQUB 0
1020 :
1030 .cprotect LDR R12,[R12]
1040 .protect STMFD R13!,{R0,R14}
1050 BL findpage:MOV R0,#1
1060 STR R0,[R12,#temp+8]
1070 ADD R0,R12,#temp
1080 SWI "XOS_SetMemMapEntries"
1090 MOV R0,#1:STRB R0,[R12,#pstate]
1100 LDMFD R13!,{R0,PC}^
1110 :
1120 .cunprotect LDR R12,[R12]
1130 .unprotect STMFD R13!,{R0,R14}
1140 BL findpage:MOV R0,#0
1150 STR R0,[R12,#temp+8]
1160 ADD R0,R12,#temp
1170 SWI "XOS_SetMemMapEntries"
1180 MOV R0,#0:STRB R0,[R12,#pstate]
1190 LDMFD R13!,{R0,PC}^
1200 :
1210 .findpage STMFD R13!,{R0-R2,R14}
1220 ADD R0,R12,#temp:MOV R1,#0
1230 MVN R2,#0:STR R2,[R0,#12]
1240 .findpage2 STR R1,[R0]
1250 SWI "XOS_ReadMemMapEntries"
1260 LDR R2,[R0,#4]:TEQ R2,#0
1270 LDMEQFD R13!,{R0-R2,PC}^
1280 ADD R1,R1,#1:B findpage2
1290 :
1300 .commtab EQUS "Protect":EQUB 0
1310 ALIGN:EQUD cprotect:EQUD 0
1320 EQUD csyntax:EQUD chelp
1330 EQUS "UnProtect":EQUB 0
1340 ALIGN:EQUD cunprotect:EQUD 0
1350 EQUD csyntax:EQUD chelp:EQUD 0
1360 :
1370 .chelp EQUS "*Protect and *UnProte
ct control the zero page memory protecti
on":EQUW &D0A
1380 .csyntax EQUS "Syntax: *Protect or
*UnProtect":EQUB 0
1390 ]
1400 NEXT pass
1410 SYS "OS_File",10,"BugBuster"
,&FFA,,code,O%
```

N.B. If you use the FrontEnd module, make sure you load it before BugBuster.

Clares' Vox Box

Nicholas David examines yet another music package from Clares.

Clares released Vox Box a few months ago, and since then it has been rather overlooked. This new music package comprises four separate multi-tasking applications. *Perform* allows Rhapsody and MIDI files as well as sound samples to be played; *VoxBeat* allows sampled percussions sounds to be transformed into useful modules for the user who has no MIDI instrument available; *VoxSample* allows sound samples to be converted for use with Maestro, Rhapsody or any application which uses voices; the final application, *VoxSynth*, allows you to synthesise Archimedes voices in a digital format.


<VoxSample$Dir>.Sample *

Sample type: Signed

Voice name: VoxSample

No. of loop cycles: 1

Volume: 100%

Pitch: +3.5

Using Vox sample with sampled sound

I can see this package appealing to many sectors, but primarily to those who already use Rhapsody or Maestro and feel that the enhancements provided by Vox Box will make a valuable addition. Let's take a closer look at what is on offer.

Although Vox Box was mainly intended to support Rhapsody II, it also couples well with Maestro and other music packages due to the way in which generated voices can be interlinked. By and large it is a package which is limited only by the user's imagination and musical flair.

PERFORM

The first application, Perform, enables you to play back music, including Rhapsody and MIDI files without the need for Rhapsody to be present in the computer. Perform can play up to twelve Rhapsody or MIDI files in sequence, which should be ample for you to construct your own mini concert! Programming the package to play in sequence couldn't be simpler. Just click on the Perform icon on the icon bar to call up a dialogue box, and then simply drag the music files onto the appropriate window in the order in which you want them to be played. Naturally there are options to save the programme so that you can play it back to your heart's content. There are also options to control output of sound and the tempo of the music. All in all I found this to be an excellent application as a result of the wide range of services which it provides.

VOX BEAT

The next application of the four is VoxBeat. This is very much the simplest of the four, although it is definitely one of the most useful: it allows you to play sampled sounds as percussion. In addition, it gives facilities for a drum kit to be used. One useful facility is that of playing sampled sounds, especially if you don't have a MIDI port. This allows you to use a sampled piece of music as a percussion accompaniment. It also allows up to 96 different samples to be played at the same time. This method employs all seven Vox Beat modules, so it is very memory hungry and thus not very practical on machines with limited memory. Other adaptations include its use as a speech synthesizer or the use of VoxBeat's pre-determined timing which allows the tune to be played for a specific period of time.

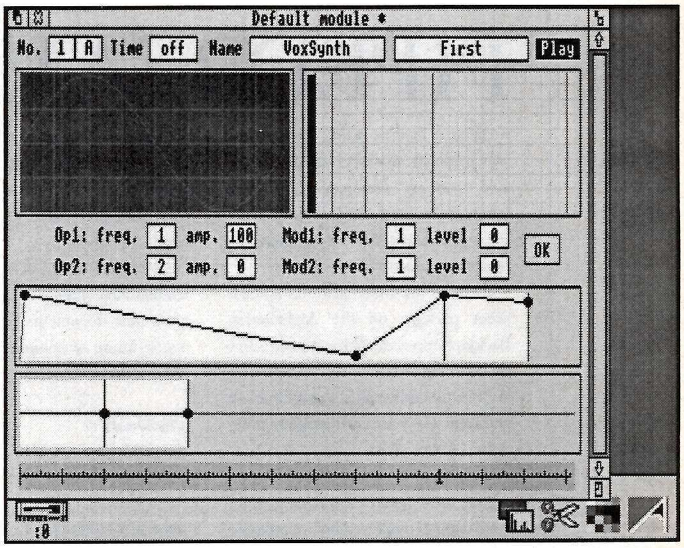
VOX SAMPLE

The third application, VoxSample, is again both useful and practical. It overcomes the many problems which are encountered when using simple sound samplers. It attends to the pitch and note length, and controls the ending of the sample very well indeed. It does this by revolutionising the way in which the program interprets the sample. It concentrates more fully on the transient note than the follow-up note which is usually sustained on simpler samplers. Because of this, a VoxSample note is made up of two parts; firstly, the transient note is played, and then one or more cycles of the entire sample are looped continuously thus forming the sustained note. This method saves a great deal of memory as a sample needs to be no more than 0.5 seconds in length in most cases. In addition, the sustained section is guaranteed to be at the correct pitch. The program also enables the user to alter the pitch of the transient note along with its amplitude. VoxSample is a most accurate and useful application.

VOX SYNTH

The last of the four, VoxSynth, is described in the manual as "moderately complex", handling as it does real-time linear interpolation. What this amounts to is the facility to synthesize voices digitally. This can be achieved in a number of ways. Each VoxSynth module provides eight independent voices, each consisting of two waveforms. Each waveform represents one complete cycle. You create these waveforms by drawing them by hand, by synthesizing them from harmonic components, or by mathematically using a form of frequency modulation (or FM) synthesis which is used by most digital synthesizers.

At the start of each note, the first waveform is used, but these waveforms gradually change into the second form as the note proceeds. However, it is worthwhile when you look at the results and advantages which are achievable. The VoxSynth modules are very compact, eight voices taking up just 5K, so you won't find yourself grabbing for a four megabyte upgrade every time you play your favourite tune. It can also match the quality of output achieved by many professional digital synthesizers, and most important of all, it's great fun to experiment with. Such features are, indeed, well worth the battle with the initial mind-boggling technical expressions which pop up in the manual.



No. 1 A Time off Name VoxSynth First

Op1: freq. 1 amp. 100 Mod1: freq. 1 level 0

Op2: freq. 2 amp. 0 Mod2: freq. 1 level 0

:0

The Vox synth module in operation

In conclusion, it is safe to say that Clares has once again come up trumps. Vox Box provides a suite of programs which will significantly enhance Maestro and Rhapsody II. It has particular appeal when you bear in mind that every Archimedes owner has a copy of Maestro with their machine. However, some may consider it expensive at £61.95 when you accept that its functions are only relevant if you already have Maestro, Rhapsody, or similar. Otherwise Vox Box forms an obvious and useful adjunct to Maestro and Rhapsody.

Product	*Vox Box*
Supplier	*Clares Micro Supplies* *98 Middlewich Road* *Rudheath Northwich* *Cheshire CW9 7DA* *Tel. 0606 48511* *Fax 0606 48512*
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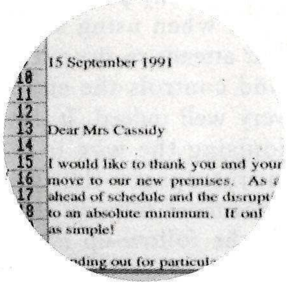
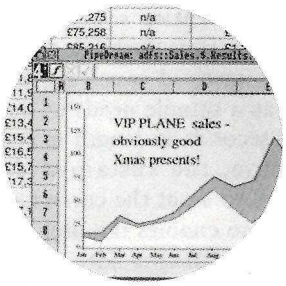


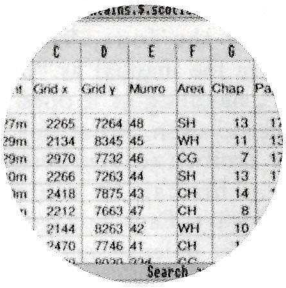
15 September 1991

Dear Mrs Cassidy

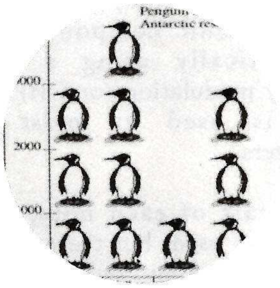
I would like to thank you and your
move to our new premises. As
ahead of schedule and the disrupt
to an absolute minimum. If onl
as simple!

nding out for particul





	C	D	E	F	G
t	Grid x	Grid y	Munro	Area	Chap	Pa
7m	2265	7264	48	SH	13	1
9m	2134	8345	45	WH	11	1
9m	2970	7732	46	CG	7	1
0m	2266	7263	44	SH	13	1
m	2418	7875	43	CH	14	
	2212	7663	47	CH	8	
	2144	8263	42	WH	10	
	470	7746	41	CH		



For reasons of space, these applications are only available on this month's magazine disc.

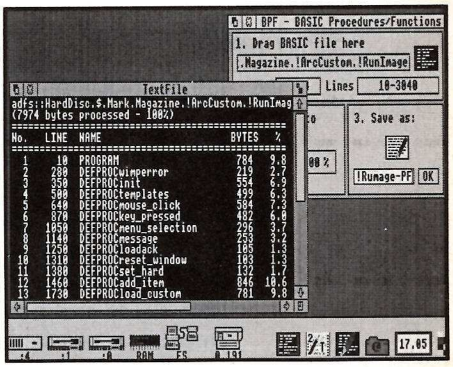
Basic Program Function/Procedure Analyser

By Graham Crow

This extremely handy application identifies all the procedures and functions in a Basic program and lists them by name, together with the line at which they are defined, their lengths, and the percentage they represent of the total program length. It also lists any procedures and functions called but not defined, defined but not called, or defined more than once.

The resulting display may be saved as a text file, for editing or printing out. The application is extremely easy to use, and operates in the background on the Desktop, so other applications can be used while the processing is being performed.

This application can ease the process of debugging Basic programs (especially wimp applications, and allows complicated programs to be analysed quickly. It can also help to cut down the size of programs by pointing out unused or duplicated routines. A must for anyone writing long Basic programs.



```
adfs::HardDisc.$.Mark.Magazine.!ArcCustom.!RunImag
(7974 bytes processed - 100%)
==================================================
No.   LINE  NAME                       BYTES    %
==================================================
  1     10  PROGRAM                     784   9.8
  2    280  DEFPROCwimperror            219   2.7
  3    350  DEFPROCinit                 554   6.9
  4    500  DEFPROCtemplates            499   6.3
  5    640  DEFPROCmouse_click          584   7.3
  6    870  DEFPROCkey_pressed          482   6.0
  7   1050  DEFPROCmenu_selection       296   3.7
  8   1140  DEFPROCmessage              253   3.2
  9   1250  DEFPROCloadack              105   1.3
 10   1310  DEFPROCreset_window         103   1.3
 11   1380  DEFPROCset_hard             132   1.7
 12   1460  DEFPROCadd_item             846  10.6
 13   1730  DEFPROCload_custom          781   9.8
```

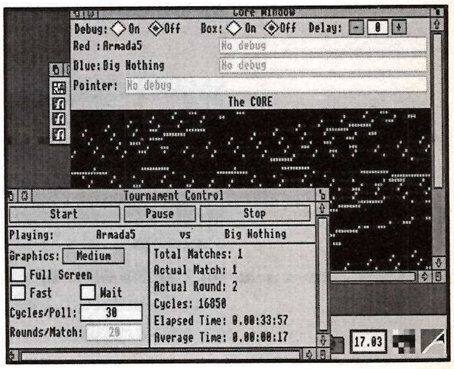
Example details of procedures

Mars Core Wars Automaton

By Cristian Ghezzi and Sergio Monesi

Core Wars is a game that you can't play, but it is endlessly fascinating. The Mars application simulates a war, a war inside the computer memory, a so-called *Core War* between digital warriors. These digital warriors take the form of programs which operate on a specified block of memory - the battlefield. The warriors are allowed to replicate themselves around the battlefield, but can't stray into memory outside the battlefield; they must stay in a restricted area, the *core*, from which they can't escape but where they can move without restrictions.

The programs are written in a special language called "Redcode" and run under supervision of the "Memory Array Redcode Simulator" (MARS). There are 31 example warrior programs included on the disc, so there is ample opportunity to simulate your own core wars without having to understand RedCode. However, there is considerable documentation included with Mars to describe the language and the method of war simulation used, so you can create your own warriors using a text editor and can import them into the battlefield scenario.



Red :Armada5 No debug
Blue:Big Nothing No debug
Pointer: No debug

Playing: Armada5 vs Big Nothing

Cycles/Poll: 30
Rounds/Match: 20

Total Matches: 1
Actual Match: 1
Actual Round: 2
Cycles: 16850
Elapsed Time: 0.00:33:57
Average Time: 0.00:00:17

A core war in progress

The wars can be conducted in the background on the Desktop, or can be run in single-tasking mode; the battlefield can also be displayed graphically, showing the state of each battle as it happens. Battle reports can be saved in text format, allowing records to be kept so you can hone your warriors to perfection. Harmless fun... or is it?!

Extending Your Character Set

By Kevin Bracey

If you use a DTP package, such as Ovation or Impression, then you may not be aware that most outline fonts contain a number of extra ones beyond the standard characters in the RISC OS system font (this is the font in which you type at the command line). In this article I will explain the uses of some of these characters, and tell you how to redefine the system font so that these extended characters appear correctly in text in the system font.

The extra characters have ASCII codes from 128 to 159. Acorn fonts contain 17 extra characters from 143 to 159, while EFF fonts typically contain those 17 characters plus eight more from 135 to 142. You can enter these characters either using the Alt key with the numeric keypad, or by using Chars, CharSel, PolyGlot or similar applications. Some EFF fonts also have a few extra characters, for example Sophie, which has an alternative ® symbol as character 130.

SMART QUOTES

Characters 144 (‘), 145 (’), 148 (“), 149 (”) & 150 („) are known as *smart quotes*. These should be used in preference to the standard *sexless* quotes, which are characters 34 (") and 39 ('), as this greatly improves the appearance of a piece of text. Character 145 should also be used as an apostrophe.

The first four of these characters can be obtained in Impression using the Ctrl key in conjunction with], \, } and |.

DASHES

There are four different types of dash available in the Latin1 character set. These are:

45: hyphen (-)
153: minus (−)
151: en dash (–)
152: em dash (—)

The hyphen, which is on the keyboard above the letter P, should only be used as a hyphen, not as a minus sign, as the minus sign (character 153) is designed to match the plus sign (character 43) in both size and position.

The en and em dashes should be used to split sentences like this – instead of the hyphen, or used to indicate a range of choices e.g. 1–4.

DAGGERS AND BULLETS

The bullet, character 143 (·), can be used to mark off points in a list, although a somewhat more interesting range of bullet characters can be found in the Dingbats font.

The daggers, characters 156 (†) and 157 (‡), are generally used to refer to footnotes.

LIGATURES

There are six ligatures in the Latin 1 character set: 154 (Œ), 155 (œ), 198 (Æ), 230 (æ), 158 (ﬁ), and 159 (ﬂ). The first four of these are only used in words from other languages, for example Æneid. In English words, the ligatures should not be used, so write “doesn’t”, not “dœsn’t”

The ﬁ and ﬂ ligatures, however, arose in the days of metal type because in some typefaces certain blocks did not fit together physically with the letter f. Because of this most sets of metal type have ligatures for ff, ffi, ffl, fi and fl. In these days of desktop publishing, the ligatures are now used only to ‘improve’ the appearance of a piece of text.

When using your DTP package, replacing fi with ﬁ and fl with ﬂ, is a nice finishing touch. This can be achieved either by using search and replace after typing the article, or by using Impression’s abbreviation function. Unfortunately Impression's spelling checker doesn't recognise ligatures as their respective characters, so it will beep at most words with fi or fl in.

EXTENDING THE SYSTEM FONT

FontExtend is a short program that will redefine the system font to include characters 135 to 159. This will greatly help you when you need to use these characters in a dialogue box, or when you are using a text editor. The Acorn definitions are based around those in the Character.Monospaced font supplied with Impression.

On my own system, I have these definitions stored in a "BBC font" file which is loaded when the system is booted up. A copy of this file is supplied as "Latin1Defs" on the magazine disc and can be produced by removing the REM statements from lines 90, 370 and 380 in *FontExtend*.

```
   10 REM           >FontExtend
   20 REM Program   Extend system font
   30 REM Version   A 1.02
   40 REM Author    Kevin Bracey
   50 REM RISC User November 1992
   60 REM Program   Subject to Copyright
   70 REM           Not Public Domain
   80 :
   90 REM *Spool Latin1Defs
  100 :
  110 VDU 23,135,0,0,0,0,0,219,219,0
     : REM ellipsis
  120 VDU 23,136,0,0,0,219,146,219,146,2
10   : REM subscript EFF
  130 VDU 23,137,8,24,40,60,8,0,0,0
     : REM superscript 4
  140 VDU 23,138,117,39,37,37,0,0,0,0
     : REM superscript TM
  150 VDU 23,139,0,0,56,24,24,24,60,0
     : REM dotless i
  160 VDU 23,140,3,6,12,24,48,96,192,0
     : REM fraction slash
  170 VDU 23,141,14,24,60,24,24,24,88,48
     : REM florin
  180 VDU 23,142,192,204,24,48,96,219,27
,0   : REM per mill
  190 VDU 23,143,0,0,60,126,126,126,60,0
     : REM bullet
  200 VDU 23,144,12,24,24,0,0,0,0,0
     : REM open single quotes
  210 VDU 23,145,12,12,24,0,0,0,0,0
     : REM close single quotes
  220 VDU 23,146,0,0,12,24,48,24,12,0
     : REM open single guillemot
  230 VDU 23,147,0,0,48,24,12,24,48,0
     : REM close single guillemot
  240 VDU 23,148,54,108,108,0,0,0,0,0
     : REM open double quotes
  250 VDU 23,149,54,54,108,0,0,0,0,0
     : REM close double quotes
  260 VDU 23,150,0,0,0,0,0,54,54,108
     : REM base double quotes
  270 VDU 23,151,0,0,0,60,0,0,0,0
     : REM en dash
  280 VDU 23,152,0,0,0,254,0,0,0,0
     : REM em dash
  290 VDU 23,153,0,0,0,126,0,0,0,0
     : REM minus
  300 VDU 23,154,63,108,108,111,108,108,
63,0 : REM OE ligature
  310 VDU 23,155,0,0,63,109,111,108,63,0
     : REM oe ligature
  320 VDU 23,156,24,126,24,24,24,24,0,0
     : REM dagger
  330 VDU 23,157,24,126,24,126,24,24,0,0
     : REM double dagger
  340 VDU 23,158,30,48,54,126,54,54,54,0
     : REM fi ligature
  350 VDU 23,159,30,54,54,126,54,54,55,0
     : REM fl ligature
  360 :
  370 REM *Spool
  380 REM *SetType Latin1Defs BBC font
```

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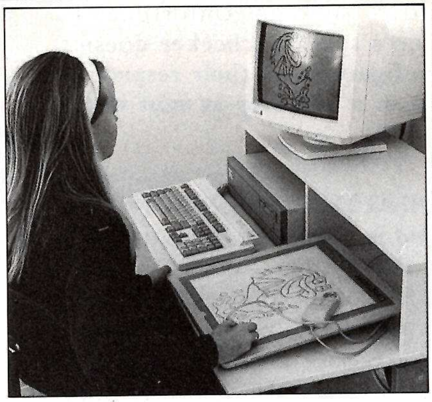
THERE ARE TIMES WHEN A MOUSE IS A REAL HANDFUL!



A mouse is great as a pointing device, but when it comes to freehand drawing in art packages, accurately tracing drawings, or mapping contours, etc., it can prove a real handicap. The TechSoft HANDIPAD digitizing tablet is an absolute device. Unlike a mouse, the puck's position on the tablet always corresponds to the cursor position on screen. The puck has cross hairs for accurate tracing. Alternatively, the pen-like stylus can be used to allow a much more natural drawing action, far better for artistic and freehand work. The stylish Handipad has a 305x305mm active area, transparent overlay sheet to place drawings under, and comes complete with mains power supply, puck, stylus and serial cable. (Makes a great mouse mat too!)

TECHSOFT HANDIPAD

Archimedes Compatible *The mouse emulation software module provided is compatible with most software applications. The module allows both mouse and tablet to be active (by simply moving the puck off the active area the mouse re-gains control). If a small drawing is to be traced, clicking either side of the drawing with the fourth puck button "zooms" this area to fill the screen.*

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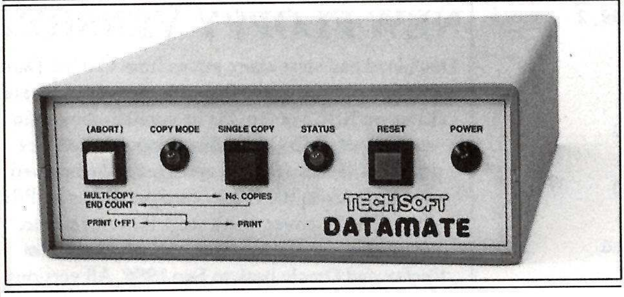

Technical: *Data Capacity 1, 2, 4 or 8Mb (upgradable) : One Centronics input/output : Single copy mode : Multi-copy Mode : Selectable auto form feed between copies: Self test mode: External mains power supply.*

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ARC PRODUCTIVITY TOOL

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SIZE	1Mb	2Mb	4Mb	8Mb
PRICE	£195	£230	£295	£425

All prices + £8 p&p. + VAT

Text Aid

Robin Watts looks at an application to help improve your text editing.

One of the areas in which RISC OS has been criticised in the past is its method for cutting and pasting text between different applications. The only Acorn approved way to do this is to select the area of text to be copied, and then to 'save' this to the destination application. While this works for simple situations, this method can be very cumbersome, and is far from ideal - for instance, transferring text to or from writable icons is impossible.

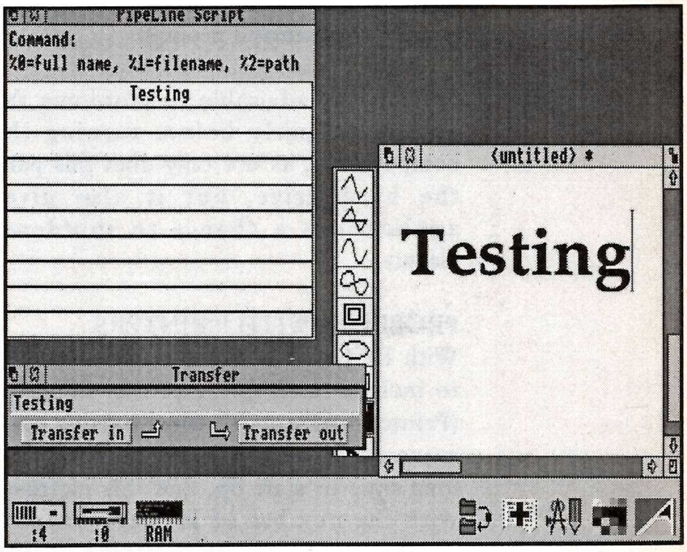
Never fear: a solution is at hand in the form of *TextAid* from newly-formed Rheingold Enterprises.

This nifty little application allows you to copy text from any writable icon or title bar, edit it, and then insert it into any other application that accepts input at the current caret position. For example, an address could be pulled from an address book application and inserted into an Impression document simply with a few key presses, even if the address book has no facility for saving individual addresses.

To transfer text is easy: simply choose the menu option to pop up the Transfer window, and click on the *Transfer* in icon. The Desktop then freezes until the mouse is clicked over an icon containing text, when TextAid grabs the text from that icon and copies it into a writable icon in the Transfer window. Once grabbed, the text can be edited if required, and can then be transferred to the caret by clicking the *Transfer* out icon. Alternatively, to transfer text into TextAid you can 'save' a selected piece of text to the Transfer window, and this will appear just as if you had transferred it as before.

My only gripe with this system as it stands is that to transfer anything, you must have a window open on the Desktop. While this is fine for applications where editing of the text is required, 99% of the time the text is wanted 'as is', and so the presence of another window is an annoyance rather than a blessing. It would be nice to be able to transfer the text from below the pointer to the caret at the press of a key, and Rheingold Enterprises is considering such a facility for future versions - in fact, it may be available before this review is published!

However, TextAid's abilities don't stop there. The author has also provided user definable macros so that you can insert commonly used bits of text into documents with one mouse click or key press. Even the Time, Date, Running page numbers, and Printer Control Codes can be inserted in seconds. The application even provides routines to convert between CSV, TSV and text files, and this function as well as the others provided are clearly described in the well written manual supplied.



Command:
%0=full name, %1=filename, %2=path

Testing

Testing

Testing

Using the transfer window

All in all this is a very neat application that performed perfectly during testing. If you need the functions TextAid provides, then at less than a tenner you can't go far wrong with this.

Product *TextAid*
Supplier *Rheingold Enterprises*
17 Ingfield Terrace
Slaithwaite
Huddersfield HD7 5BJ
Tel/Fax 0484 846126
Price *£9.95 inc. VAT and p&p*

RISC OS 3 Hints and Tips

A round up of hints and other information for users of RISC OS 3, by David Spencer.

DESKTOP SHUTDOWN

Pressing Shift-Ctrl-F12 on RISC OS 2 used to exit from the Desktop, leaving you with a star command prompt. On RISC OS 3, the action is changed to perform a shutdown sequence (parking hard discs etc.). Once this is completed you are left with a box allowing the Desktop to be restarted. Pressing Shift-Ctrl-F12 at this point will have the old effect of leaving the Desktop and giving you a star command prompt.

It is always advisable to shutdown the system properly before turning the computer off, as not only does this park the hard drive, but it also gives applications a chance to shutdown cleanly.

PROBLEMS WITH !PRINTERS

With RISC OS 3, it would seem sensible to include loading the printer manager (Printers) as part of the Desktop boot sequence. However, Printers takes a very long time to start up, and this increases with the number of printers defined. Therefore, if you are going to do this, limit the number of printer definitions that you include to the bare minimum.

There are also a number of problems with the printing system in RISC OS 3.00 (but which have been fixed in version 3.10). One particular problem is that editing and then saving the text margins for a particular paper size causes them all to be set to zero, and text printing not to work properly. Another problem is that changing the printer margins for the LaserJet type drivers actually shifts the position of the output on the page, instead of just defining the area that cannot be printed in.

DESKTOP BOOTING

The Task Manager provides a very convenient way of saving a Desktop boot file and enabling auto-booting. However, it doesn't set the auto-boot action for the drive containing the boot file. Instead, this must be done manually by bringing up the command line with F12, selecting the drive that contains the boot file, for example with:

```
*ADFS
*Mount 4
```

and setting the boot option using:

```
*Opt 4 2
```

If the boot option is set wrongly, either the Desktop will not be booted, or unexpected results such as a string of errors will occur. Incidentally, if you want to boot from a drive other than the default you will need to reconfigure the default filing system and drive. This is explained in the RISC OS 3 User Guide.

MULTI-TASKING COMMANDS

Under RISC OS 3, files containing sets of star commands can be given the filetypes TaskExec (&FD6) or TaskObey (&FD7). These are executed in the same manner as the more normal Exec or Obey files, but instead of freezing the Desktop, they are pre-emptively multi-tasked using the TaskWindow module. This means that their output is displayed within an Edit window, and other applications continue to run normally. This can be very useful for users of older versions of the C compiler and Assembler who set up command files to control the compilation, as these will now multi-task.

ICONISED ICONS

Users of RISC OS 3 will probably know that if they click Select on the close box of a window with Shift held down, rather than closing the window, it is collapsed to

RISC User Volume 5 Special Disc

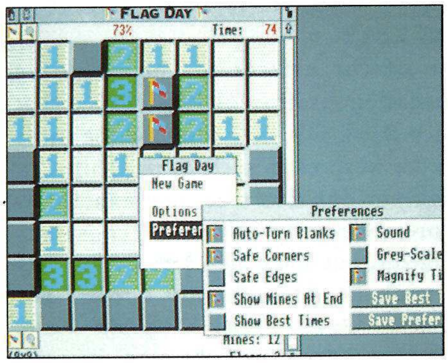
This month we are celebrating the successful completion of the fifth year of publication of RISC User magazine and the start of Volume 6. To mark the occasion we are once again releasing one of our highly popular special discs, this time for Volume 5. The Volume 5 Special Disc contains a selection of the best items published throughout Volume 5, updated and improved where appropriate, plus several new and specially written items. Even if you have previously obtained some of these items, the whole disc at just £4.95 inc. VAT offers exceptional value for money - see for yourself:

High Quality Clip Art

Two Draw files containing a selection of high quality clip art. Included are dozens of arrows and various flashes and borders for use with a wide range of applications, particularly DTP.

Flag Day

A new and addictive Desktop game in which you must use logic to find mines in a minefield in as short a time as possible. Highly addictive, and extremely well implemented, with many user selectable features such as difficulty levels and a high score table.



Tools for Draw

A specially written application, combining two programs from Volume 5, which allows various shapes to be created in Draw that are hard to achieve with Draw itself. Lines, arcs, polygons, sectors and boxes can now all be drawn with ease, and imported into Draw and other suitable applications.

Telephone Call Coster

A fully multi-tasking application designed to provide a quick and easy way to cost telephone calls. Both national and international calls are catered for and the charges can be edited to provide maximum flexibility for the future.

Producing a Street Map Using Draw

This is another enhanced application from Volume 5 which enables professional looking street maps to be generated using Draw. The original application has been updated to allow dotted roads to be included to signify pedestrian areas, and roundabouts can also be created.

Filer Plus

A handy Desktop application that allows you to datestamp a file, change its filetype, and open directory viewers for the printer and serial ports.

New Outline Fonts

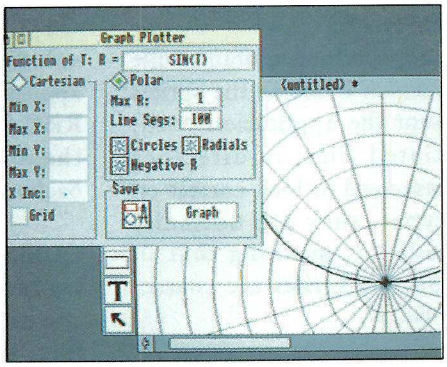
Two fonts, Mercury and Military, for use with any applications that use outline fonts. Both fonts are fully scaffolded and hinted, and contain definitions for the international characters in the Latin1 character set.

Module Information Application

An application which displays details of any RISC OS modules which are dragged to it, so that you can tell a module's version number at a glance without having to load it or leave the Desktop.

Graph Plotting Application

This application combines and updates two previously published items to provide full plotting of both Cartesian and polar graphs in the form of Draw files, all using an intuitive Desktop window.

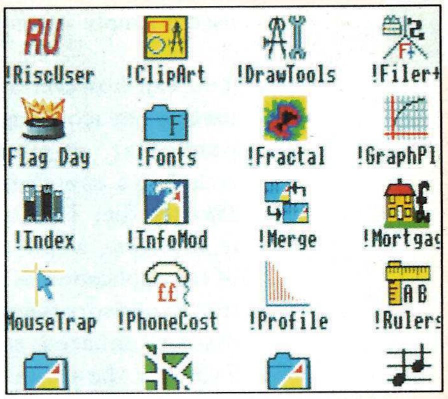


Mortgage Term Analyser

A highly topical application which displays repayment mortgage details in a graphical form, showing how you can save money in the long run. This is a full mortgage management system which allows the user to determine many options in the analysis of the resulting graphs.

Basic Program Profiler

This application helps you to identify the performance bottlenecks in your Basic programs. No longer will you be halving the time one procedure takes only to find that it shaves a measly one percent off the total execution time of your program.



Desktop Character Rulers Application

This application allows two rulers to be displayed on the Desktop to enable sequences of characters in the system font to be measured very easily.

Music

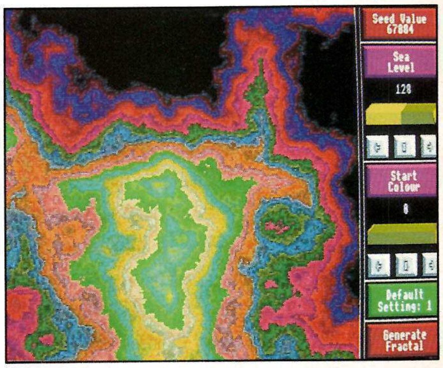
A transcription of Komm, Jesu, Komm by J.S.Bach, in the form of a Maestro file - this is another new item, previously unpublished in RISC User.

Mouse Pointer Controller

This application enables movement of the mouse pointer to be constrained in either the horizontal or vertical directions, useful for drawing perpendicular lines in Draw, for example.

Random Fractal Generator

A very fast fractal generator, previously unpublished, which generates an endless variety of patterns, all at the touch of a mouse button.



ArcScan Index

to RISC User Volume 5.

RISC User Volume 5 Special Disc is available on Special Offer to members for 4.95 inc.VAT. Stock Code PV5S. P&P£1 Offer available only until the 31 December 1992. Normal price will be 9.95 inc. VAT to members (£14.95 non-members).

an icon on the pinboard, which can be re-opened by clicking on it. Normally, for windows belonging to applications other than the Filer of those built in, the icon used is simply an empty window symbol.

You can however specify a sprite to be used when iconising the windows for a particular application, simply by including a new sprite in the application's *!Sprites* file. This sprite must be called *ic_appname*, where *appname* is the name of the application as shown in the task list (not necessarily the application's name on disc) truncated to nine characters. Typically the sprite will be the standard empty window sprite with the application's small filer sprite (*sm!appname*) in the middle. The empty window sprite is called *ic_?* and can be found by opening the root directory from the Apps icon on the icon bar and loading the file *Resources.Wimp.Sprites*.

HI-RES ICON SPRITES

Traditionally, applications contain a file called *!Sprites* which contains the sprites used to represent the application itself, and its associated files, in directory displays. As these need to look correct on all monitor types, they are normally defined in mode 12, meaning that in multisync modes the sprites are coarser than they need be.

RISC OS 3 resolves this problem by allowing different sprite files for different types of mode. These all have then name *!Spritesxx*, where *xx* is a two-digit suffix relating to the mode's characteristics. For hi-res mono modes, the suffix 23 is used, while for all other modes, the first digit of the suffix is the number of OS units per pixel in the X direction, and the second is the same, but for the Y direction. This gives suffixes of 22 for multisync modes and 24 for normal modes.

The Wimp will automatically add the correct suffix when using the *IconSprites command, and if the file cannot be found, will use the old form without the suffix. This means that if you define three files: *!Sprites* for normal modes, *!Sprites22* for multisync modes and *!Sprites23* for hi-res mono modes, then the application will work properly under both RISC OS 2 and 3. It should be noted, though, that the mode is only checked when the application is started. Therefore, changing the screen mode will not change the sprites for applications already running.

ODD KEYS

One of the effects of the on-going internationalisation of RISC OS is that under RISC OS 3.10 some of the more obscure keypresses such as the Shift-Ctrl combinations don't behave exactly as before. Normally this won't cause any problems, but some applications that rely on such keypresses may suffer. For example, Ovation uses Shift-Ctrl-< and Shift-Ctrl-> to change the text size, and this will not work as standard under RISC OS 3.10. There is however a simple solution which involves running the application called IntKey supplied on the RISC OS 3.10 Support Disc. This loads in the old keyboard driver to ensure backwards compatibility.

COMMAND ABBREVIATIONS

Under RISC OS 3, some common command abbreviations have changed from their function in RISC OS 2. For example, *BA. now means *Back and not *Basic as before. This change is not really intentional, but rather is a result of the fact that the order of modules within RISC OS has been changed, and this in turn controls the order in which star commands are looked up. The RISC OS 3.10 Support Disc contains a file called *Commands* which, when run, sets up a number of aliases to restore the abbreviations to their RISC OS 2 meanings. As an aside, command abbreviations should only ever be used directly at the command line. Applications that issue star commands themselves must use the full names to avoid the chance of the wrong command being issued.

MONITOR SENSING

By default, the newer Acorn machines (A5000 onwards) sense the type of monitor connected using wired loop-backs within the monitor itself or its cable. This is very handy in ensuring that the correct screen modes are chosen, but does mean that the monitor must be correctly connected when the computer is turned on. If for example the monitor lead has worked loose and you push it back in after the computer has been turned on, you may well need to perform a hard reset before a stable picture is produced.

WHAT NO *SPEAKER?

On the A3010, A3020 and A4000 the *Speaker command which should enable or disable the internal speaker independently of the other audio outputs doesn't have any effect as the necessary hardware has been left out. *Speaker is still implemented, so issuing it won't cause an error, but the internal speaker will always be enabled unless headphones are plugged into the rear of the machine.

CARE WITH DOS DISCS

The ability of RISC OS 3 to handle DOS format discs is extremely useful for interworking with PCs, but there are several reasons why this format should be used for this purpose only. Firstly, DOS discs only allow eight characters per name, resulting for example in *Templates* becoming *Template*. Secondly, all filenames are forced to upper case, which, while not affecting operation, does make them look less neat. Thirdly, DOS discs are considerably slower than their ADFS counterparts. Finally, it is vital to dismount DOS discs before removing them, as in some cases all the data may not have been written back.

WHICH VERSION?

If a program needs to know exactly which version of RISC OS it is running on, one of the best ways to find out is to look at the version number of the UtilityModule, which is always the same as that of the operating system itself. This could be done using a SYS "OS_Module" call, but often it is sufficient to know if the version is above a particular one, rather than finding the actual version, and this is best done using *RMEnsure. For example:

```
    *RMEnsure UtilityModule 3.00 Set OS$Old 1
```

will set the system variable *OS$Old* if run on a pre-RISC OS 3 machine. This type of command is particularly useful in *!Run* files to decide on what course of action of take.

USING OLD PRINTER DRIVERS

If you need to use a RISC OS 2 printer driver under RISC OS 3 (for example because you don't have a RISC OS 3 version), then you can normally do so provided that the document being printed doesn't contain any new features such as rotated sprites or text. However, if you subsequently want to switch back to RISC OS 3 printer drivers without resetting the computer you need to issue the following two commands to ensure the correct modules are activated:

```
    *RMKill PDriver
    *RMReinit PDriver
```

Incidentally, when upgrading from RISC OS 3.00 to 3.10 you need to ensure you also change to the new *Printers* application, as this has changed between the two versions.

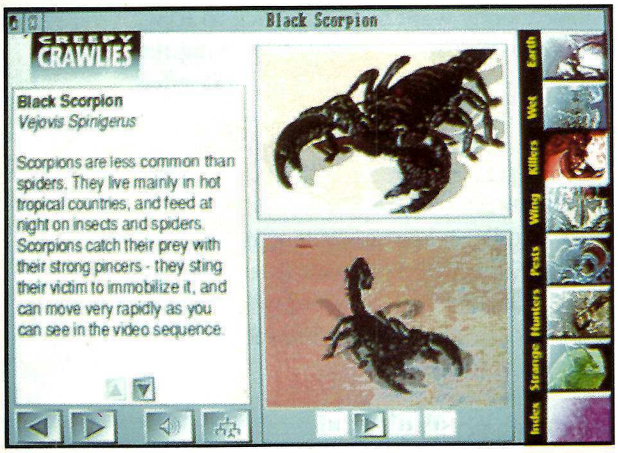
ADDING FONTS

When creating a *!Fonts* directory for use with RISC OS 3, you should start with the one supplied on the RISC OS 3 applications disc and add font directories to it as required. If you attempt to use a *!Fonts* directory from RISC OS 2 it won't work properly as it will contain a version of the font manager that is older than that within the RISC OS 3 ROM. This is elaborated upon in the RISC OS 3.10 Release Notes.

State of the Art: CD-ROMs

Alan Wrigley looks at some of the latest offerings in the multimedia market.

CD-ROMs are beginning to appear on the Acorn market in numbers, helped no doubt by the growing interest in multimedia across the whole spectrum of computing (see *Multimedia*, RISC User 5:2). Publishers are starting to realise that RISC OS is an ideal vehicle for multimedia, and a number of discs which had previously been issued for use with other systems are now being given a RISC OS front end. Even where this is not considered worthwhile at present, many CD-ROMs published for the PC market can be used under the PC Emulator.



Black Scorpion
Vejovis Spinigerus

Scorpions are less common than spiders. They live mainly in hot tropical countries, and feed at night on insects and spiders. Scorpions catch their prey with their strong pincers - they sting their victim to immobilize it, and can move very rapidly as you can see in the video sequence.

Creepy Crawlies

THE HUTCHINSON ENCYCLOPEDIA

Encyclopedias are an ideal subject for CD-ROM. Thumbing through a huge printed volume in search of the right reference is tedious and often complicated. Following a trail of references and marking each one as you go is even more so. An electronic version which can be linked to sophisticated retrieval software is therefore an enormous boon. Not only that, but having found the item you want, you can then export the text (and sometimes an illustration) directly to your own document without the chore of copying it all out by hand.

Attica Cybernetics has packed the entire Hutchinson Encyclopedia onto a CD-ROM with an accompanying RISC OS application to retrieve and display the information. You can browse through the entire encyclopedia (all 25,147 entries), or narrow down your search to one of 7 subject areas (History, Biography, Places etc.). A title list shows all the entries in alphabetical order, and by double-clicking on any of these the full encyclopedia entry for that item can be read.

The real power of an electronic encyclopedia becomes apparent when you want to search for particular items or follow a trail of cross-references. You can perform a straightforward word search, or a logical search using AND, OR or NOT logic on any number of search words. This is a very powerful facility and enables you to narrow down your search intelligently.

Many of the entries have cross-references built into the text; for example, the Cold War has cross-references for both NATO and the Warsaw Pact. Clicking on the cross-reference icon takes you straight to the corresponding entry. The application keeps track of the entries you read, and you can backtrack at will if you want to refer back to an item you were reading previously. I felt that many more cross-references could have been included in the encyclopedia, and hopefully later versions will do so.

Any section of text can be marked with the mouse and saved as a file or sent to a printer driver. A few entries have an associated picture or sound clip which can be accessed from a tool window, and the picture can also be saved or printed.

The Hutchinson Encyclopedia will be very useful as a powerful reference tool for libraries etc. It costs £99 ex. VAT.

GROOVY SOUND

Hot off the press from Media Design Interactive are three new CD-ROMs (all RISC OS-based). *Grooves* provides a collection of royalty-free music clips which can be used in multimedia productions. In terms of software resources, sound has been something of a poor relation to graphics on the Arc up to now, but with its 500Mb+ of storage capacity, CD-ROM may soon change that.

There are 90 musical items on this CD-ROM, covering many styles of music, and varying in length from a few seconds to 1½ minutes. All are professionally recorded by session musicians (i.e. “real” music, not just computer-generated), and all can be used for non-commercial purposes without paying royalties. The recordings are of true hi-fi quality sound (equal to audio CDs), and can be played either through the CD-ROM drive's audio output, or through the computer using Acorn's *Replay* application.

Styles covered by *Grooves* include numerous dance rhythms, ballads, reggae, rock and funk, modern jazz, classical, and instruments such as piano, sitar, flute and bells. Items can be exported as sound samples, sound modules or Replay sound files. *Grooves* is an excellent idea, well produced, and should encourage a greater use of sound in multimedia applications. It costs £99 ex. VAT.

A WAREHOUSE FULL OF ART

Image Warehouse (also £99 ex. VAT) aims to do for graphics what Grooves does for sound. This ROM contains 360 images, mostly in colour, and each one is supplied in four different sprite formats - mode 15 or mode 28 with large and small versions for each mode. The range of images covers straightforward clip art subjects such as maps, computer items etc., imaginative artwork often with a surrealistic feel (see the illustration), a good range of backgrounds and textures, and a wide variety of scanned photographs from sunsets to portraits. Unlike much clip art around, this has not just been lifted from American PD collections, but has been put together professionally - even the photographs were taken specifically for the collection.

Included on the CD-ROM is a copy of ChangeFSI (Acorn's image manipulation application) to enable you to alter the pictures for your own purposes, and a small application called *Picture* which cycles through all the sprites in a directory, displaying them on the screen one by one. Accompanying the CD is a booklet containing a small black-and-white picture of each image for easy reference - a very thoughtful inclusion.

Image warehouse

VIDEO NASTIES

The last of the three new releases from MDI is *Creepy Crawlies*, a multimedia guide to all the nastiest little creatures you are ever likely to meet. The guide is divided into categories such as earth insects, creatures from wet environments, hunters and killers, winged insects, pests and just downright strange creatures.

Some 70 creatures are covered, including most of the nasties you can think of: worms, spiders, scorpions, crabs, mites, snails, ants, millipedes, snakes, slugs - ugh! Clicking on any creature from the index opens a display card showing a colour picture (which can be expanded to fill the whole screen if required) and some textual information. Control icons are provided to display a movie sequence in large or small

continued on page 40

New Book

Wimp Programming for All

On Acorn RISC Computers

by Lee Calcraft and Alan Wrigley

We believe that Wimp Programming for All will prove to be the definitive book on this subject for all users of Acorn RISC computers.

This new book, scheduled for publication mid October, provides programmers with a complete introduction to all the techniques involved in writing multi-tasking Wimp programs to run within the RISC OS Desktop environment. No prior knowledge of the Wimp is assumed and the tutorial style of the book will enable all programmers to understand the concepts involved and to develop their skills in writing high quality programs within the Desktop environment.

Contents

Wimp Programming for All derives from the highly popular series of articles originally published in volume 3 of RISC User magazine and written by Lee Calcraft. This has been extensively revised with substantial additional material, all brought up to date for RISC OS 3.

To support the book there will be a disc containing all the programs (at different stages of development) as listed within the book, together with additional supporting applications.

Price and Availability

The book is scheduled for release in mid-October with a cover price of £12.95. The accompanying disc will be available at the same time for £4.95 (inc. VAT).

The book consists of ten main chapters and a number of appendices:

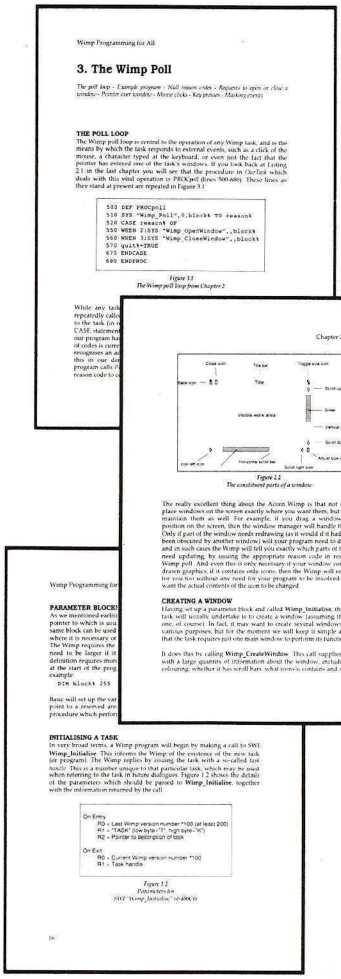
- Chapter 1: Introducing the Wimp
- Chapter 2: Windows
- Chapter 3: The Wimp Poll Loop
- Chapter 4: Error Handling
- Chapter 5: Icons
- Chapter 6: Menus
- Chapter 7: Redrawing Windows
- Chapter 8: The Wimp Message System, Loading and Saving Data
- Chapter 9: Templates
- Chapter 10: Printer Drivers and Outline Fonts

- Appendix A: RISC OS 3
- Appendix B: Indirection Operators
- Appendix C: Application Resources
- Appendix D: Setting up a sprite area
- Appendix E: The Wimp Programmer's Toolkit
- Appendix F: SWI calls described in this book

SPECIAL OFFER
for RISC User subscribers:

£14.95

Buy the book and disc together for just £14.95!



Wimp Programming for All

3. The Wimp Poll

The poll loop - Example program - Null reason codes - Requests to open or close a window - Pointer over window - Mouse clicks - Key presses - Masking events

THE POLL LOOP
The Wimp poll loop is central to the operation of any Wimp task, and is the means by which the task responds to external events, such as a click of the mouse, a character typed at the keyboard, or even just the fact that the pointer has entered one of the task's windows. If you look back at Listing 2.1 in the last chapter you will see that the procedure in *OurTask* which deals with this vital operation is *PROCpoll* (lines 500-680). These lines as they stand at present are repeated in Figure 3.1

```
500 DEF PROCpoll
510 SYS "Wimp_Poll",0,block% TO reason%
520 CASE reason% OF
550 WHEN 2:SYS "Wimp_OpenWindow",,block%
560 WHEN 3:SYS "Wimp_CloseWindow",,block%
570 quit%=TRUE
670 ENDCASE
680 ENDPROC
```

Figure 3.1
The Wimp poll loop from Chapter 2

While any task
repeatedly calle
to the task (in c
CASE statement
our program ha
of codes is curre
recognises an ac
this in our de
program calls *P*
reason code to c

Chapter 2: Windows

Figure 2.2
The constituent parts of a window

The really excellent thing about the Acorn Wimp is that not only will it place windows on the screen exactly where you want them, but it will fully maintain them as well. For example, if you drag a window to a new position on the screen, then the window manager will handle this for you. Only if part of the window needs redrawing (as it would if it had previously been obscured by another window) will your program need to do anything, and in such cases the Wimp will tell you exactly which parts of the window need updating, by issuing the appropriate reason code in response to a Wimp poll. And even this is only necessary if your window contains user-drawn graphics; if it contains only icons, then the Wimp will redraw these for you too without any need for your program to be involved unless you want the actual contents of the icon to be changed.

CREATING A WINDOW
Having set up a parameter block and called **Wimp_Initialise**, the next job a task will usually undertake is to create a window (assuming that it needs one, of course). In fact, it may want to create several windows to use for various purposes, but for the moment we will keep it simple and assume that the task requires just one main window to perform its function.

It does this by calling **Wimp_CreateWindow**. This call supplies the Wimp with a large quantity of information about the window, including its size, colouring, whether it has scroll bars, what icons it contains and so on. Since

25

Wimp Programming for

PARAMETER BLOCK
As we mentioned earlie
pointer to which is usu
same block can be used
where it is necessary or
The Wimp requires the
need to be larger if it
definition requires mor
at the start of the prog
example:

```
DIM block% 255
```

Basic will set up the var
point to a reserved are
procedure which perfor

INITIALISING A TASK
In very broad terms, a Wimp program will begin by making a call to SWI **Wimp_Initialise**. This informs the Wimp of the existence of the new task (or program). The Wimp replies by issuing the task with a so-called *task handle*. This is a number unique to that particular task, which may be used when referring to the task in future dialogues. Figure 1.2 shows the details of the parameters which should be passed to **Wimp_Initialise**, together with the information returned by the call.

On Entry
R0 = Last Wimp version number *100 (at least 200)
R1 = "TASK" (low byte="T", high byte="K")
R2 = Pointer to description of task

On Exit
R0 = Current Wimp version number *100
R1 = Task handle

Figure 1.2
Parameters for
SWI "Wimp_Initialise" (&400C0)

16

Code			
BK12	Wimp Programming for All book	£12.95 incVat	Please add £2 p&p in each case.
BK13	Wimp Programming for All book and disc	£14.95 incVat	

RISC Developments, 117 Hatfield Road, St Albans, Herts AL1 4JS. Tel 0727 40303 Fax 0727 860263

Boxes

By John Venn and Jack Pike

This version of the traditional game of Boxes is a nice short listing to type in, and has an unusual set of rules that makes the game very challenging. The object of the game is to fill the board with more boxes of your colour than your opponent. To draw lines on the playing grid, simply click with the mouse between two dots, and a line will be placed between them. If you draw the third side of a box, then your opponent will win that box and the box will be coloured with your opponent's colour. Any other box which has three sides filled will then also go to your opponent.

To play the game, just type in the program listed, save it and run it. When it is run, you will be asked for the size of the grid (try 10 to start with), and at the end of the game the result and statistics are shown. Have fun!

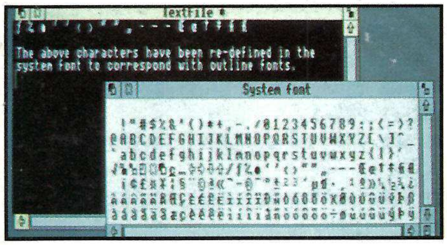
```
   10 REM            >Boxes
   20 REM Program    Boxes
   30 REM Version    A 1.00
   40 REM Authors    John Venn/Jack Pike
   50 REM RISC User November 1992
   60 REM Program    Subject to Copyright
   70 REM            Not Public Domain
   80 :
   90 MODE 12:oldat%=@%:@%=&90A
  100 ON ERROR @%=oldat%:MODE 0:REPORT:P
RINT"at line ";ERL:END
  110 PRINT TAB(32,3);"BOXES"
  120 REPEAT
  130 PRINT TAB(10,16);"Choose the numbe
r of boxes along a side (1-15)";
  140 INPUT N:N=N+1
  150 PRINT TAB(10,16);SPC(60)
  160 UNTIL N>1 AND N<17
  170 CLS
  180 DIM B(N-1,N-1),H(N,N),V(N,N),N$(1)
  190 N$(1)=" RED TO GO "
  200 N$(0)="GREEN TO GO"
  210 MOUSE ON
  220 MOUSE RECTANGLE 200,50,760,760
  230 DX=760/(N-1)
  240 FOR I=1 TO N:FOR J=1 TO N
  250 CIRCLE FILL 200+DX*(I-1),50+DX*(J-
1),4
  260 NEXT J:NEXT I
  270 G%=1:RED%=0:GRN%=0:REPEAT
  280 G%=1-G%:GCOL 2-G%:COLOUR 2-G%
  290 PRINT TAB(31,3);N$(G%);
  300 REPEAT
  310 REPEAT:MOUSE X,Y,B:UNTIL B=4
  320 X=(X-200)/DX+1:Y=(Y-50)/DX+1
  330 PX=INT(X+0.5):PY=INT(Y+0.5)
  340 QX=PX:QY=PY
  350 IF ABS(X-PX)>ABS(Y-PY) THEN QX=PX+
SGN(X-PX) ELSE QY=PY+SGN(Y-PY)
  360 UNTIL NOT((PX=QX AND V(PX,(PY+QY)/
2)=1) OR (PY=QY AND H((PX+QX)/2,PY)=1))
  370 IF PX=QX THEN V(PX,(PY+QY)/2)=1 EL
SE H((PX+QX)/2,PY)=1
  380 MOVE 200+760*(PX-1)/(N-1),50+760*(
PY-1)/(N-1)
  390 DRAW 200+760*(QX-1)/(N-1),50+760*(
QY-1)/(N-1)
  400 REPEAT:F%=0
  410 FOR I=1 TO N-1:FOR J=1 TO N-1
  420 SIDES=H(I,J)+H(I,J+1)+V(I,J)+V(I+1
,J)
  430 IF SIDES=3 THEN
  440 H(I,J)=1:H(I,J+1)=1
  450 V(I,J)=1:V(I+1,J)=1
  460 GCOL 1+G%:RECTANGLE FILL 200+DX*(I
-1),50+DX*(J-1),DX,DX
  470 F%=1:RED%=RED%-(G%=0)
  480 GRN%=GRN%-(G%=1):B(I,J)=1
  490 ENDIF
  500 IF SIDES=4 AND B(I,J)=0 THEN
  510 RECTANGLE FILL 200+DX*(I-1),50+DX*
(J-1),DX,DX
  520 F%=1:RED%=RED%-(G%=0)
  530 GRN%=GRN%-(G%=1):B(I,J)=1
  540 ENDIF
  550 NEXT J:NEXT I
  560 UNTIL F%=0
  570 REPEAT:MOUSE X,Y,B:UNTIL B<>4
  580 COLOUR 1:PRINT TAB(24,0);"RED ";RE
D%;" BOXES";
  590 COLOUR 2:PRINT"   GREEN ";GRN%;" B
OXES"
  600 UNTIL RED%+GRN%=(N-1)^2
  610 IF RED%>GRN% THEN COLOUR 1:PRINT T
AB(30,3);"RED  WINS  ";RED%"-"GRN%
  620 IF RED%<GRN% THEN COLOUR 2:PRINT T
AB(30,3);"GREEN WINS ";GRN%"-"RED%
  630 IF RED%=GRN% THEN COLOUR 7:PRINT T
AB(30,3);"   DRAW    ";GRN%"-"RED%
  640 COLOUR 7:GCOL 7:MOUSE OFF:END
```

RISC User Disc Contents No

BugBuster Module

The magazine disc contains an enhanced version of the BugBuster module. This allows programs which are in infinite loops to be terminated, thus preventing the machine from hanging up. The module also detects when an 'Abort on data transfer' has been caused by an access violation to low memory (a common problem when debugging Wimp applications), and reports it as a more friendly error message, including the failed instruction and the address it was trying to access.

Extending Your System Font

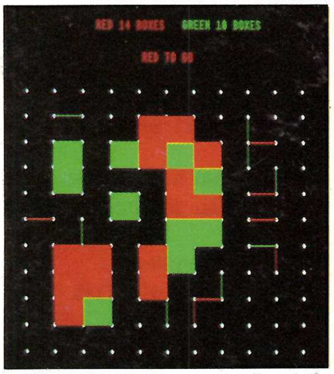


The above characters have been re-defined in the system font to correspond with outline fonts.

```
 !"#$%&'()*+,-./0123456789:;<=>?
@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_
`abcdefghijklmnopqrstuvwxyz{|}~
```

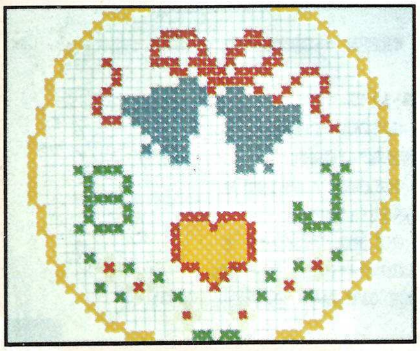
This program redefines characters 135 to 159 of the system font so that they reflect the ligatures available in most outline fonts. This enables text editors such as Edit to display their text with the same characters as found in outline fonts.

The Game of Boxes



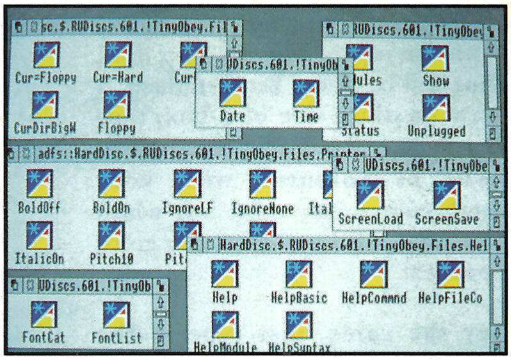
This simple game for two players implements the classic game of boxes with a twist - instead of trying to complete four sides of each box, players must try not to complete the third side of any box, or that box will go to their opponent. An interesting version of a great game.

Textile Design in Draw



A complete textile pattern as a Draw file produced using the methods outlined in the article in this month's magazine.

Into the Arc: Tiny Obey Files



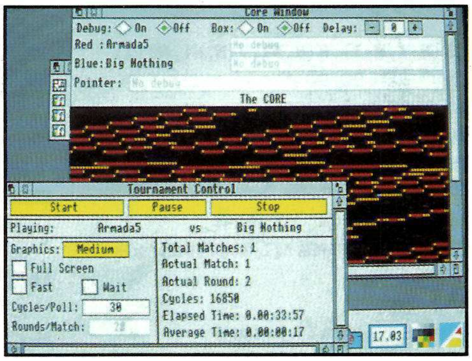
All the Obey and Command files described in Into the Arc are included on this disc.

Jello and the Art of 3D Graphics (Part 2)

The program from the first part of this series is repeated here. It displays an icosahedron on the screen in three dimensions, complete with the correct shading. The shape can be rotated with the mouse to give a very realistic sense of depth. The assembler source code on the disc comes with copious comments to describe how the program works, and there is also a text file describing the general program flow.

ADDITIONAL ITEMS REFERRED TO IN THE MAGAZINE

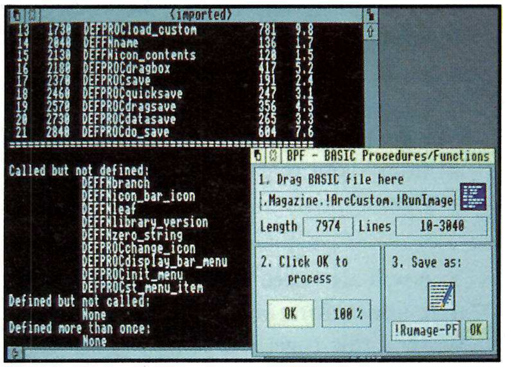
Mars Core Wars Automaton



Debug: ○ On ● Off Box: ○ On ● Off Delay: 0
Red : Armada5
Blue: Big Nothing
Pointer: No debug
Playing: Armada5 vs Big Nothing
Graphics: Medium
☐ Full Screen
☐ Fast ☐ Wait
Cycles/Poll: 30
Rounds/Match: 20
Total Matches: 1
Actual Match: 1
Actual Round: 2
Cycles: 16850
Elapsed Time: 0.00:33:57
Average Time: 0.00:00:17

A fascinating implementation of Core Wars on the Desktop. This takes the form of two digital warriors, described by programs, fighting it out in an area of memory. The battle can be viewed graphically in a window on the Desktop, and there are 31 example warrior programs included on the disc. The language used to describe warriors (called RedCode) is explained in a large help file, allowing you to create your own warriors to your own specification. Most enjoyable!

Basic Program Function/ Procedure Analyser



```
 13   1730  DEFPROCload_custom        781   9.8
 14   2040  DEFFNname                 136   1.7
 15   2130  DEFFNicon_contents        120   1.5
 16   2180  DEFPROCdragbox            417   5.2
 17   2370  DEFPROCsave               191   2.4
 18   2460  DEFPROCquicksave          247   3.1
 19   2570  DEFPROCdragsave           356   4.5
 20   2730  DEFPROCdatasave           265   3.3
 21   2840  DEFPROCdo_save            604   7.6
==============================================

Called but not defined:
                DEFFNbranch
                DEFFNicon_bar_icon
                DEFFNleaf
                DEFFNlibrary_version
                DEFFNzero_string
                DEFPROCchange_icon
                DEFPROCdisplay_bar_menu
                DEFPROCinit_menu
                DEFPROCst_menu_item
Defined but not called:
                None
Defined more than once:
                None
```

.Magazine.!ArcCustom.!RunImage

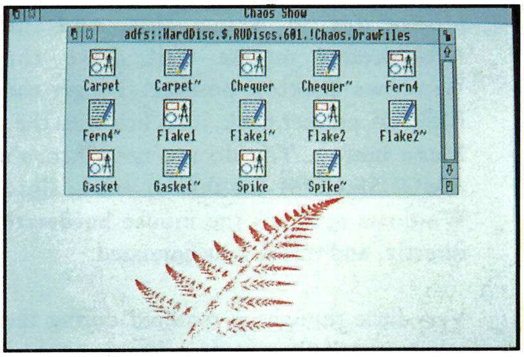
Length 7974 Lines 10-3040

!Rumage-PF

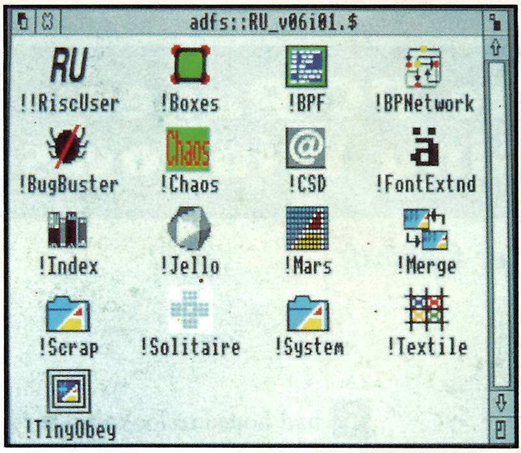
A very handy application which lists out details of all functions and procedures in a Basic program. Details include the name of the routines, the lines at which they are defined, their lengths, and the percentage they represent of the total program length. It also lists any routine called but not defined, defined but not called, or defined more than once - invaluable for the Basic programmer.

BONUS ITEMS

The Chaos Game: Fractal Generation



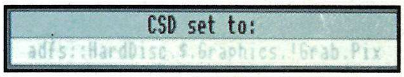
This program introduces a new twist to the world of fractal graphics. You create a shape in Draw, which is then transformed into a text file by the application. This text file is then interpreted and the corresponding fractal image appears in a window on the Desktop. Seven example Draw files are supplied on this disc, showing the large variety of patterns which can be produced.



Back Propagation Network

An implementation of a neural network using back propagation. Data for solving the classic XOR problem of network theory is supplied.

Enhanced CSD Application

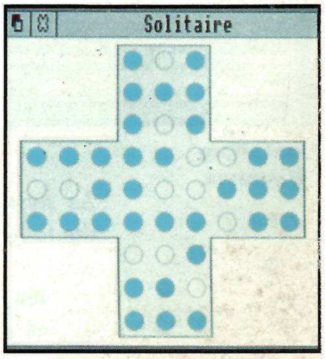


CSD set to:

adfs::HardDisc.$.Graphics.!Grab.Pix

This application allows the Currently Selected Directory (CSD) to be set easily from the Desktop. The application icon can be placed anywhere (be it on a backdrop or on the icon bar), and dragging it into a directory sets that directory to the CSD. Clicking Adjust on the icon opens up a viewer for the CSD, and all choices can be saved so the icon will appear at the same place whenever the application is run.

Solitaire



A simple game to while away those long winter nights. The classic game of Solitaire has been reproduced on the Desktop, and the mouse can be used to drag pegs around the board. The game will tell you when you are stuck, and we can guarantee that will happen quite a lot!

ArcScan Data

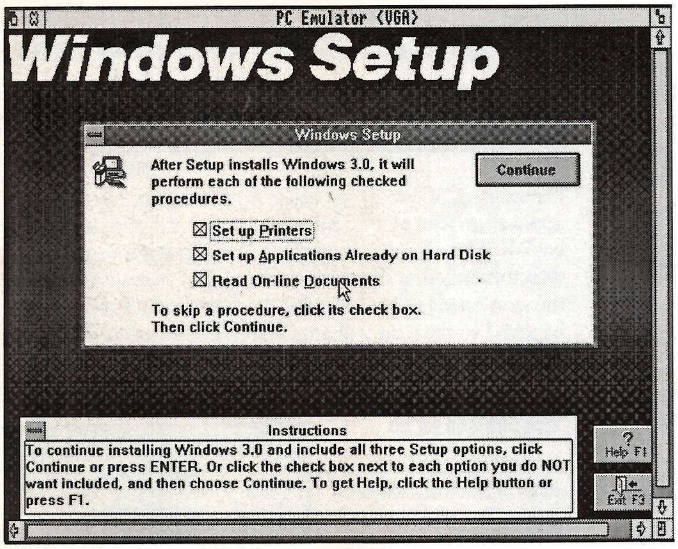
ArcScan indexes for this issue of RISC User and BEEBUG Vol.11 No.5.

All the applications in this month's magazine and a selection of bonus items are available for only £4.75 inc VAT.

The PC Pages: Using Windows

By Lee Calcraft

I had hoped to look into the installation of Microsoft Windows 3.1 on the Emulator this month. But after borrowing an A5000 so as to be able to read the high density discs on which my Windows 3.1 was supplied, I hit an insurmountable barrier at the very first step.



After Setup installs Windows 3.0, it will perform each of the following checked procedures.

☒ Set up Printers
☒ Set up Applications Already on Hard Disk
☒ Read On-line Documents

To skip a procedure, click its check box.
Then click Continue.

To continue installing Windows 3.0 and include all three Setup options, click Continue or press ENTER. Or click the check box next to each option you do NOT want included, and then choose Continue. To get Help, click the Help button or press F1.

Installing Windows

As soon as I began the setup procedure the following error message appeared:

```
You attempted to install Windows 3.1
on a computer with an 8086 or 8088
processor. Windows 3.1 requires an
80286 processor (or higher).
```

On contacting Acorn about this, they were their usual non-committal selves, and would not say whether they were working on the problem or not. My guess is that in all probability they are, since Windows compatibility is viewed as an important feature of the Emulator. And while you may still be able to purchase an old copy of Windows 3.0 (which *does* work on the Emulator), it has been completely superseded by version 3.1. So maybe we can look forward to a complete 80286 emulation soon? In the meantime, I decided to check out Windows 3.0.

INSTALLING WINDOWS 3.0

Windows 3.0 is supplied on no less than seven 720K discs, so as you might guess, installation is a longish procedure. In fact you do not get much change out of half an hour - and that is if all goes according to plan.

You will also need at least 4.5Mb of hard disc space for the job. Once you have scraped this together, put your Emulator into VGA (or extended EGA) mode, find yourself a good book, and then type:

```
A:
SETUP
```

Then just follow the on-screen instructions.

Once the pointer appears on the PC screen, you should be able to move the RISC OS pointer into the Emulator window, and if you click the Menu button, the menu will offer a *Connect mouse* option. Select this, and the Archimedes mouse will drive the Windows desktop pointer. To get the RISC OS pointer back, just click with the Menu button. You do not need Acorn's AMOUSE.COM for this to work, since Windows accesses the mouse hardware directly, and this is fully emulated.

Very little thought is required during the whole installation process, but there are a couple of questions to answer, such as confirming the hardware detected by the installer routines. In their wisdom these routines deduced that the Archimedes keyboard only had 84 keys, so I had to put them straight on this. Also, much later you are asked to select drivers for your printer. Scrolling through the hundreds of printers takes an age, and if you are using a Panasonic, like me, your journey to the "P" entries will be frustrating: there are none.

Still, once the chore is over, Windows is installed, and you can get into it any time that you want just by typing:

```
    WIN
```

at the DOS prompt (assuming that you have set a path to the WINDOWS directory), or you can incorporate the command into your AUTOEXEC.BAT file for automatic booting.

WINDOWS 3.0 IN USE

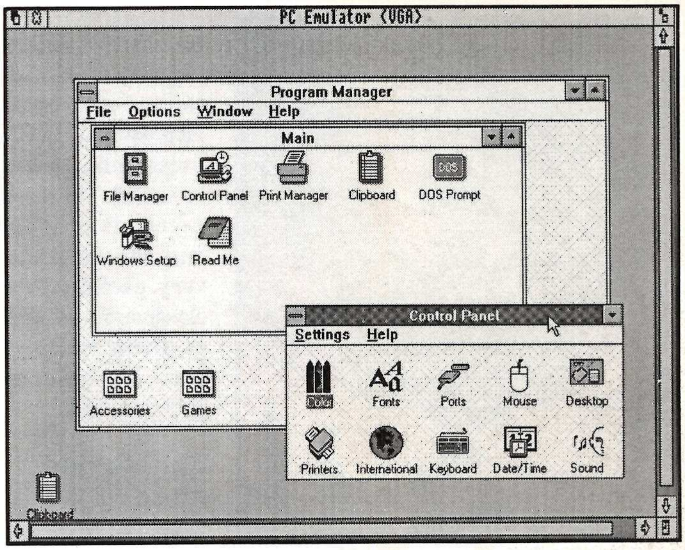
So how does Windows 3.0 perform? Let it first be said that Windows 3.0 (and its successor 3.1) do not offer the same intuitive graphical user interface that Archimedes and Apple Macintosh users take for granted - Bill Gates is getting there, but not very quickly.

For example, you will need to keep open the Program Manager window in order to display files on the desktop, and the File Manager window from which this is achieved can only move within the Program Manager window. And in their turn, the directories on display are bounded by this second window. This is a very cumbersome approach.

Even more of a problem is the speed of the emulation. If you are running Windows on a normal PC it is recommended that you use at least an 80386-based machine. The PC Emulator, even running on an ARM3, does not get anywhere near to this performance, and I found that it was really rather difficult to use Windows on my (ARM3) A540.

Just moving the pointer across the screen caused problems, with it temporarily disappearing from view at every inch of its path. Redrawing after a window drag can also take a very long time: up to 10 seconds, even with an ARM3 (and up to 15 seconds with the cache off).

But it *does* work - all we need now is a tenfold increase in ARM processor speed - an asynchronous ARM chip should do nicely!



Windows in use

DOS 5 DOSSHELL AND THE MOUSE

One or two readers have reported a problem using DosShell (on DOS 5) with the mouse. If you load the mouse driver then use DosShell with the mouse, all goes well to start with. But after a few selections you get a runtime error (type R6003), and the Emulator crashes (though not the Desktop). Acorn were unaware of this problem, but are looking into it now, and I will report back if there is any news. Thanks to those readers who spotted this.

It is worth adding that you can control DosShell completely from the keyboard with the cursor keys etc., and that this is the only workaround until Acorn can provide a fix.

size, show the creature's classification details, or play a sound clip which consists of a spoken commentary. All these facilities are available on each and every creature in the guide, not just a selected few.

The text description can be displayed in either English or French (other languages will be supported later), and in a simple or more advanced form (for different age groups). For the moment the spoken commentary remains in English however.

Image warehouse

As you might expect, the full range of export facilities is available - text, sprite, movie or sound. This is an excellent product and should prove very useful in the classroom, as well as giving hours of fun. The price is £99 ex. VAT.

CROSSWORD CRAZY

Finally, for the crossword addicts among you, *Crossword Cracker* from Nimbus Information Systems costs £40 ex. VAT and will run under the PC Emulator. If you have ever felt like ending it all over a stubborn crossword clue, then this application is for you. Over 171,000 words are contained in its dictionary, and to use the program all you have to do is state how many letters are in the word, then fill in those letters that you already have. The computer does the rest, displaying a list of all matching words. No more sleepless nights or cats in fear of their lives!

On the same CD is a program called *Margana*, which helps you to create anagrams. Simply give it a word and it will display all matching anagrams. A *guess* feature is also included which, when activated, will look for other words which incorporate the letters. For example, asking for anagrams of "Archimedes" will produce one result - Archimedes! But using the guess facility also comes up with "merchandise".

New CD-ROMs are appearing all the time, and there are several being compiled at present for future release. Among these is Emerald Publishing's RISC OS Technical Documentation CD, details of which were given in last month's news pages, and which is now expected to be available by Christmas.

When you first use any of these CD-ROMs, you might be inclined to curse at the slow speed at which things happen, particularly when moving from one item to another. This is primarily due to the slow access time of the CD drive compared to that of a hard disc, and there is little the software authors can do about it. Nevertheless, CD-ROM remains a very exciting medium for the kind of applications I have described here, and we can expect many more to follow them.

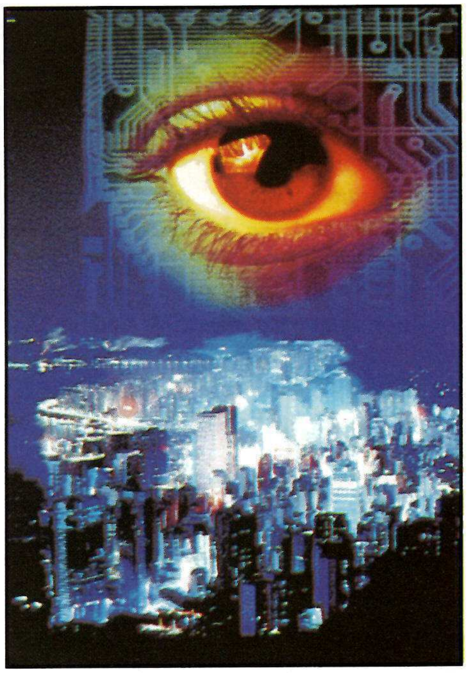


Image warehouse

All the products mentioned in this survey are available from Optech Ltd., East Street, Farnham, Surrey GU9 7XX, tel. (0252) 714340.

Archimedes Game Maker's Manual

Ricky Delarre delves into this new book, and reports on his findings.

I have had difficulty accepting that the idea behind this recent offering from Sigma Press, entitled *The Archimedes Game Maker's Manual*, is a good one. Games writing is a field which spans several diverse disciplines, and at times it can even be argued into the ranks of an art form. The subject is as boundless as human imagination itself. How then, can an author seriously expect to write a comprehensive manual about it? Read on.

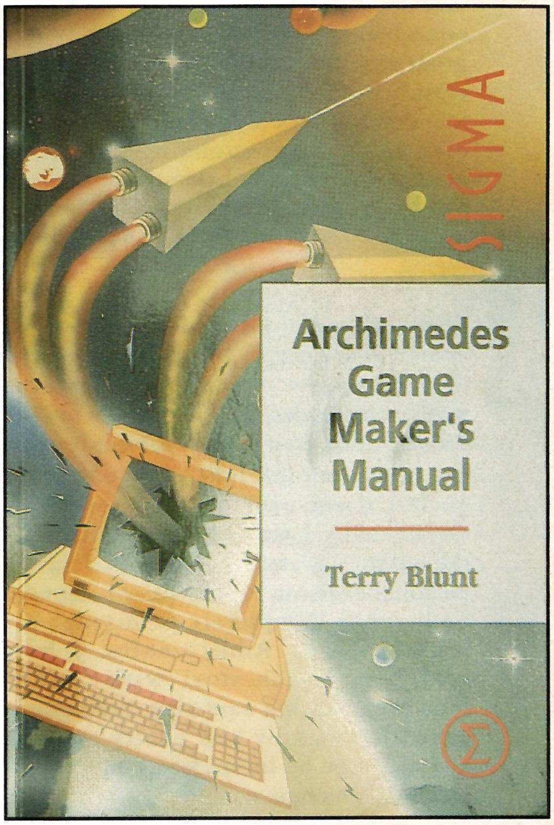
Unfortunately, the title of the book implies to me that it is aimed at the subject in a holistic fashion - you know, 'everything you need to know to become a top-selling games author'. Not so. It is instead focused on the newcomer to games writing (while also being poised to appeal to the novice programmer) and is directed specifically at the programming issues which occur during the implementation of games. It deals with the other aspects in only a very cursory way.

CONTENTS

What, then, does the tender reader find amongst these 250 pages? After a brief introduction, a chapter on *Early Planning* ensues. Here, a discussion on finding ideas rapidly turns into advice on how to think up games ideas which will sell. Oh, dear! I felt for the author in his attempt to suggest ideas - but should he have even tried? A half-page attempt is made in this chapter to deal with the psychology of game-play, but I would have preferred something much more substantial.

It is in the next chapter, entitled *More Planning* that my first major gripe over the book's style and approach arises. I was repeatedly frustrated by the author's tendency to write short paragraphs in no apparent logical order about seemingly unrelated subjects under a generally inappropriate chapter title. I'll spare you examples, but suffice to say the text has a distinctively 'bitty' feel to it, reading more like a *Hints & Tips* page from a magazine.

A fairly extensive chapter on *Static Graphics* (you know, sprites that don't move, that sort of thing) details many techniques which are undoubtedly in use all over the place. These techniques are clearly explained and there are many worked examples and useful paragraphs on sprites, user-defined characters, multiple screens, etc.



From the static to the dynamic, a chapter entitled *Making it Move* fearlessly explores the methods used when dealing with animation. This chapter is peppered with useful hints and tips.

Following this, there is a chapter on 3D programming techniques and a great section on sound; probably the best in the book.

The second major part of the book consists of a set of chapters which deal with the three main game types: Arcade games, Role play and Strategy. Within each of those chapters the author details programming techniques which are particularly relevant to that game type.

At the end of the book, just before the appendices, there is a section containing hints and tips for ARM code programming.

STYLE

The book is liberally scattered with Basic code fragments and sometimes whole programs, but unfortunately the code is mainly rather lacking in comments. I found this a little hypocritical in the face of a very proper-sounding section on good documentation habits. Thankfully, a program disc is available from the publisher to overcome all that tedious typing.

There is a useful piece of information on nearly every page, but the problem is that it appears in a rather disordered way to the reader; it is impossible to read for very long on a chosen subject because just when you are least expecting it the author dives off into another topic. Occasionally I was a rather irritated by the author's grammatical errors. I have a personal aversion to over use of commas, as it tends completely to disrupt my reading flow. Additionally, I hate sentences which start with 'but'... However, having said that the style is generally friendly and chatty enough, and will not be intimidating to the less technical amongst us.

Occasionally the book brings up the subject of Acorn recommended style and compatibility. Unfortunately I discovered at least one example of incorrect advice; Acorn deprecated use of the MemAlloc module at least a year ago, but the author recommends you contact the company for a distribution licence. You could try - but you won't get one.

CONCLUSIONS

I will try to haul my comments to a close by saying that it is important to remember the nature of the targeted market. This book is called a 'manual'. I think of a manual as a logically ordered, and usually quite formal reference text on a specific subject. This book just does not have that kind of discipline; it is far more a tutorial than a reference manual - but somehow is does not fit this description either. It has a major advantage over the other, more formal, manuals in that the information and techniques provided tend to be applied rather than abstract. So often when reading reference manuals etc., one comes across a piece of information on how some function or call operates, and although the description is clear, formal and precise, the reader is left with a big question mark over how and when that facility may be useful. It's a bit like describing a steering wheel to someone who has never seen a car before. This book takes a far more applied and down to earth approach, and the reader is left with no doubt whatsoever as to the use or suitability of a given function for a given task. This is a great feature.

As I said, it is important to remember that this book is aimed at the novice Archimedes programmer and would-be games writer, and I think when considered in that light it does its job well - and for very little cost. If you fit the description then buy it, make a decision about whether games writing is for you, and then go out and buy the real manuals (e.g. the PRM, the BBC Basic Guide and a book on Assembler). Keep this one close at hand, though - it will provide explanations of techniques, and clues to the appropriate usage of certain facilities, which are lacking elsewhere. Oh, and be prepared to spend ten times more on those manuals as you did on this one!

Product	*Archimedes Game Maker's Manual*
Supplier	*Sigma Press* *1 South Oak Lane* *Wilmslow* *Cheshire SK9 6AR*
Price	*£14.95*

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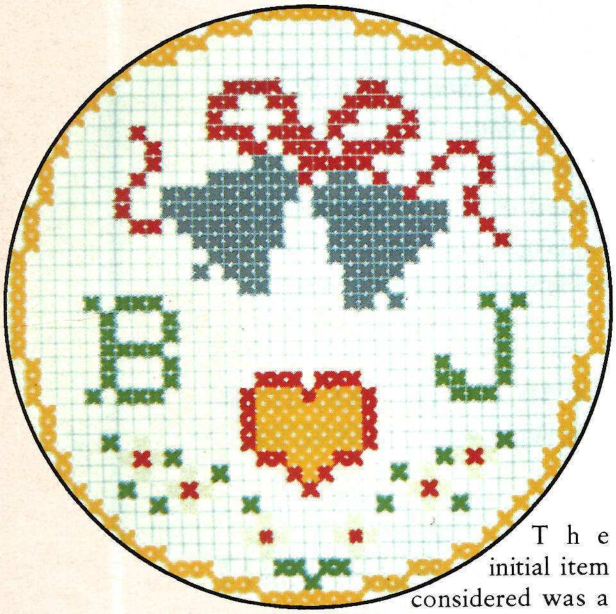
Textile Design in Draw

David Houldcraft describes a more unusual application of Draw.

I was recently approached to help design patterns for personalised articles of embroidery, so I felt that this was a problem for the Arc.



The initial item considered was a basic 'lacey' cushion having a 23cm square front face in the centre of which is a 10cm circular piece of Aida on which the embroidery is worked. There are 39 embroidery elements across the diameter - one cross or straight stitch is used for each element. The pattern of the Aida weave was set up on the Arc screen with Draw using a grid of lines locked to a 1/3 centimetre pitch.

A simple cross was constructed on one of the square elements of the grid using two straight lines of width 4mm with rounded end caps. These lines were grouped, and formed the basic cross stitch. Single stitches were composed of single line sections.

The simple cross pattern was then coloured appropriately and copied as required using the Adjust button on the mouse. The resultant cross patterns could then be placed onto the Aida grid in the proposed positions of the stitches to form the overall picture.

Provided the grid lock is kept on there is no problem in rapidly and accurately registering the elemental patterns. By this means various ideas for the embroidery can be tried, and if not found satisfactory can be quickly revised.

Lettering for name initials can be developed to the extent of the designer's capability and imagination. However, it is possible to superimpose a prescribed font over the Aida grid (with grid lock off), to size this to the grid, then, after ensuring correct registration of the Aida grid with the Draw grid switching the grid lock back on, filling the squares over and adjacent to the font letter with the incremental stitch patterns. The original font is then removed and finally the stitch patterns are grouped. Some care and experience is required in this, as in any art form. However, the results to date have proved very satisfactory.

Once the design is finished it may be printed and the embroidery worked. The printing is of course easier to understand in colour, but if a colour printer is not to hand, the colours may be changed to shades of grey with reasonable results being achieved.

The discussion so far has centred round a simple design. However, the principle has been extended to larger and more complex designs which have taken the form of plaques, and pictorial tapestries, using sprite pictures as masters to set the stitch patterns. These have required the use of finer grid subdivisions, but, to date, no difficulties have been encountered.

Jello and the Art of 3D Graphics
Part 2: Heavy Maths Explanation!

Mark Moxon continues his trip into the third dimension by describing how last month's program works.

If you followed last month's article, then you should have a program to display a rotating Jello on your screen; this month I'll try to explain how it works. I shan't go into great detail about the intricate workings of the program, but instead I'll concentrate on the techniques used, and for those who want to know how I've actually implemented these ideas, the program on the magazine disc contains lots of helpful comments.

The following sections deal with projection, rotation, hidden surface removal and colouring the Jello. The methods described are quite mathematical, which is unfortunately unavoidable in 3D graphics. However, what I will do is to state a method that you can use, and then I'll describe why it works; if you have no great desire to get lost in the maths, don't worry, as you don't *need* to know why the methods work to use them.

PROJECTION: SQUEEZING THREE DIMENSIONS INTO TWO

The first concept to try to understand with 3D graphics is how to display a three dimensional object on a two dimensional screen. The method is surprisingly simple, and is related to the familiar concept of perspective. Imagine a train track stretching out into the distance. If we call the end of the train track in the distance the *origin*, then the further away an object is from us, the nearer to the origin the object appears to be.

This observation leads us to the first fundamental rule of 3D graphics. In the above example the origin is the point we see when we look straight ahead; in computer graphics this is at the centre of the screen, so first we must define the centre of the screen to be at co-ordinate (0,0). The rule is then as follows:
Given a point (x,y,z) in space, this should be displayed on the screen at point (k*x/z,k*y/z), where k is a constant.

Now we've got the definition out of the way, why does it work, and how does it relate to perspective? When z is large (the point is far away), the values k*x/z and k*y/z will be small, so the point will be displayed close to the origin, and when z is small (the point is close to us), the values k*x/z and k*y/z will be large, so the point will be displayed further away from the origin, just as with the train track. The constant k is there simply to allow us to tailor the rule to our specific screen size, and it also allows the apparent size of objects to be altered (i.e. is an object the size of a house or the size of a mouse?). This method is called projection, and is implemented in the program *ScreenJell*.

So, now we know how to display three dimensional objects on a flat screen, how do we cope with rotating objects in three dimensions, and how do we display the Jello correctly? Let's look at rotation first.

ROTATING IN THREE DIMENSIONS

Rotating an object in three dimensions about an origin can be performed by rotating it twice in two dimensions about that origin; what this means may be made clearer by an example. Imagine you are holding a torch so that the beam is facing directly in front of you in a horizontal direction, and you want to rotate the beam so it is pointing slightly up to your right. You can achieve this either by moving the beam straight to this direction (which is rotation in three dimensions), or by moving the beam to your right a little, and then moving it up to the required point. These two latter rotations are in two dimensions - in the first case, the beam remains horizontal, so we can ignore the "up-down" dimension, and in the second case the beam is only moving up or down, so we can ignore the "left-right" dimension.

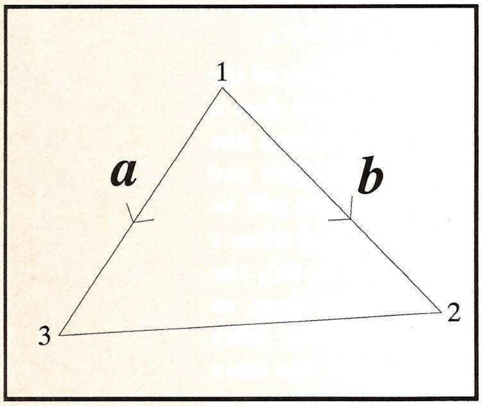


Figure 1
Rotation

What this means is that if we can rotate a point in two dimensions about the origin, then we can use this twice to rotate in three dimensions about the origin. Therefore the method I am about to describe applies to two dimensions only, as if I was drawing on a piece of paper. This is the rotation rule:

Rotating the point (x,y) about the origin (0,0) through an angle of A degrees moves the point to (x',y'), where

$$x' = x*COS(A) + y*SIN(A)$$
$$y' = y*COS(A) - x*SIN(A)$$

This rotation is shown in figure 1. The program implements these equations in *Rotation* and the Jello and cube are rotated in *RotateJell* and *RotateCube*. The trigonometrical data table used to look up sines and cosines is produced by *CreateData;* the look-up table method is far quicker than calculating the functions at the time.

For those who can't stand maths and the above is more than enough for one day, I'd recommend you skip to the next subheading. For the masochists among you, this is how the above formulae have been derived. Let angle B be the angle between the x-axis and the line joining the origin to (x,y), and let r be the distance of (x,y) from the origin, which is the same as the distance of (x',y') from the origin - see figure 1 again. Then we have:

```
    y = r*SIN(B)
    x = r*COS(B)
```

From the laws of trigonometry, we then get our required equation as follows:

```
    x' = r*COS(A+B)
    = r*[COS(A)*COS(B) + SIN(A)*SIN(B)]
    = x*COS(A) + y*SIN(A)
    y' = r*SIN(A+B)
    = r*[COS(A)*SIN(B) - SIN(A)*COS(B)]
    = y*COS(A) - x*SIN(A)
```

HIDDEN SURFACE REMOVAL

The next problem with displaying a solid object on a screen is harder to solve. Imagine you want to display a house on your screen, and you decide to draw the back of the house first, and then the front. This is fine if you are looking at the front of the house, as the back will be obscured by the front. However, if you rotate the object so you are looking at the back (and still keep to the plan of drawing the back of the house first), then the front of the house will be displayed after the back, ruining the picture. One way of solving this problem is to work out the distance of each part of the house from the viewer and display the parts in order, starting with the furthest away, but the algorithms to do this are complicated, and there is an easier solution for our particular system

The solution I have adopted for the Jello works as follows. If we can work out which faces of the Jello are facing away from us, then we don't display those faces, and the above problem does not arise, as no two faces will now overlap. This is a little like displaying either the front or the back of the house, but not both at the same time, and it works because you can't see the back of the house from the front, and vice-versa. The limitations with this method are that objects must be convex (like cubes and spheres, but not like a bowl), and objects must be solid so that you can't see through them.

So, how can you tell if a face is visible? Inevitably the answer lies in some fancy mathematics, so prepare yourselves again. Let us take a face of the Jello (a triangle), which is made up of three points (numbered 1 to 3, counted in a clockwise direction when the triangle is facing us). Now project this onto the screen (as described above), so that point 1 goes to (x1,y1), point 2 to (x2,y2) and point 3 to (x3,y3), all on the screen. The rule is:

If (x3-x1)(y2-y1) - (y3-y1)*(x2-x1) is less than zero, the face is turned away from us and is hidden.*

This algorithm is implemented in *DrawJello*. For those who can't take another dose of maths, you'd better skip to the next subheading, because here comes the explanation...

Let **a** and **b** be the vectors from (x1,y1) to (x3,y3) and from (x1,y1) to (x2,y2) respectively (see figure 2). These two vectors are in the plane of the screen, so the vector product of them (**axb**) will be a vector perpendicular to the screen. Because of the way we have set up the numbers of the points (counting clockwise when the face is facing us), the face will be hidden if this vector points into the screen. In mathematical systems, this will be if the z component of the vector is negative (though in 3D graphics we take the z-axis to be positive into the screen). Thus we have the calculation of the vector product as follows:

Let **i**,**j**,**k** be unit vectors in the x,y,z directions respectively. Then

$$\mathbf{axb} = \begin{vmatrix} \mathrm{i} & a1 & b1 \\ \mathrm{j} & a2 & b2 \\ \mathrm{k} & 0 & 0 \end{vmatrix} = (a1*b2 - a2*b1)\mathbf{k}$$

$$\text{where } \mathbf{a} = \begin{pmatrix} a1 \\ a2 \end{pmatrix} \quad \mathbf{b} = \begin{pmatrix} b1 \\ b2 \end{pmatrix}$$

This gives the above formula when the vectors are calculated in terms of x and y co-ordinates, i.e. a1=x3-x1, a2=y3-y1, b1=x2-x1, b2=y2-y1.

THE LAST TECHNICAL BIT: COLOURS

Don't worry: there isn't any more maths to be learnt. But, you're asking, how do you know when to display a face of the Jello in bright red, and when to show it in dark red? Well, the above value we calculated to test whether a face is visible or not also gives us the information we require, because the value is large when the size of the face on the screen is large, and is small when the face looks small. This means that when a face is viewed head on (when it should be coloured bright), the value is larger than when it is at an angle to the line of sight (when it should be coloured dark).

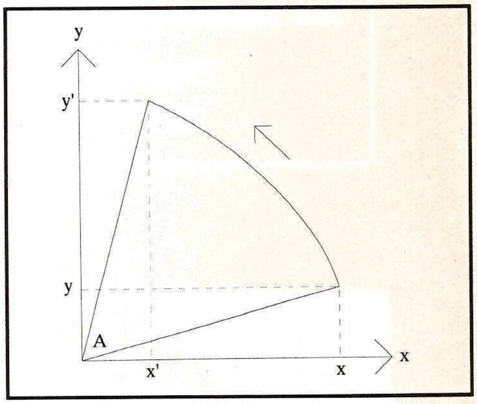


Figure 2 Hidden surface removal

However, if the Jello is far away, its faces will appear smaller, so the brightness will be dimmer. This can sometimes be the desired effect, but is not what we require here. The solution is to move the Jello to a specific spot (I move it to the distance given in *zdist%*), calculate the values for hidden surfaces as above, and use these values to determine the brightness of each face. In this way the Jello will appear to be equally well illuminated regardless of the Jello's distance. Note that the Jello is not drawn at this new position - the move is simply made to make the brightness values correct.

ENOUGH MATHS, ON WITH THE JELLO

That's all the information you need to display 3D graphics, subject to the limitations described above. The code added to the program next month will display the Jello inside a wire cube, an effect which uses no more maths than that described above. See you then!

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Ovation and the Canon BJ-10ex

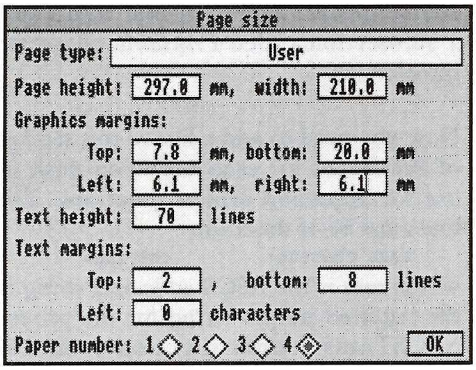
Richard Williams advises on those critical problems in aligning pages on the paper.

Ovation and the BJ-10ex printer together produce very high quality print. However, it is not very clear how the combinations of left margins and offsets affect the final positioning of print on the paper. The following explanations may help other readers to fathom this out.

Margins can be defined in three different places as detailed below.

PRINTER MARGINS

The printer itself has two markers on the lid to aid in the positioning of the paper. The leftmost is labelled 'LTR/LGL' and the rightmost 'A4/B4'.



Page size
Page type: User
Page height: 297.0 mm, width: 210.0 mm
Graphics margins:
Top: 7.8 mm, bottom: 20.0 mm
Left: 6.1 mm, right: 6.1 mm
Text height: 70 lines
Text margins:
Top: 2 , bottom: 8 lines
Left: 0 characters
Paper number: 1◇ 2◇ 3◇ 4◈

Figure 1
Page size dialogue box from PrinterDM

When paper is aligned with the 'LTR' marker, the first possible print position is 6.4mm from the left-hand edge. Similarly, the margin with the 'A4' marker is 3.4mm, and these settings are totally independent of any software settings.

OVATION MARGINS

Ovation provides the option for defining a left-hand margin on the *New Document* screen. If you are using one frame per page, then the margin can be modified by using the *Modify Frame* menu option.

PRINTER DRIVER MARGINS

The PrinterDM software also contains the option for defining margins in the Graphics section. This is relevant for Ovation as it uses graphics mode with your selected outline fonts to achieve the high-quality print. The effect of the margins can be viewed in Ovation as a grey border by using *View Print Margin* from the *View* menu.

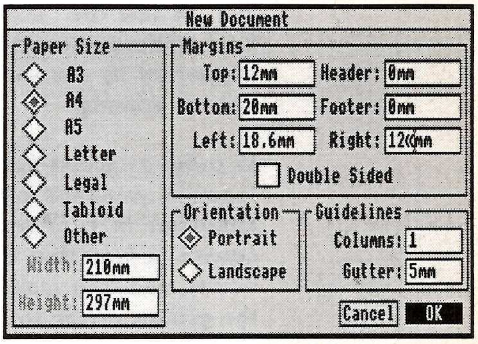
Given these three possible influences on the final left-hand margin, the problem is to work out how the margin values interact, and what values to use to position the final print accurately on the paper (of course, it must be said here that pin-point accuracy is not feasible when loading each sheet by hand).

The full equation is as follows:

Actual printed margin = (3.4mm or 6.4mm) + Ovation left margin - PrinterDM left margin

The simplest solution is to eliminate one of the options, and my choice is to give the printer left and right margins a zero value as shown in figure 1 above. This means that the margins you see on the screen become those you see on the paper plus either 3.4mm or 6.4mm depending upon the way the paper is loaded.

An example may help to clarify matters further.



New Document
Paper Size
◇ A3
◈ A4
◇ A5
◇ Letter
◇ Legal
◇ Tabloid
◇ Other
Width: 210mm
Height: 297mm
Margins
Top: 12mm Header: 0mm
Bottom: 20mm Footer: 0mm
Left: 18.6mm Right: 12mm
☐ Double Sided
Orientation
◈ Portrait
◇ Landscape
Guidelines
Columns: 1
Gutter: 5mm

Figure 2
Ovation's page layout dialogue box

Step 1: Decide the actual left margin required on the printed page, preferably in millimetres, say 25mm.

Step 2: Choose the positioning of the paper in the printer - that is will it be aligned with the 'LTR' or "A4" marker? I chose 'LTR'.

Step 3: Calculate the Ovation left margin by subtracting the Step 2 value from the Step 1 value. In my case this is 25mm-6.4mm, or 18.6mm.

Step 4: Choose 'New Document' from the Ovation Icon menu. Enter the result from Step 3 as the left margin, as shown in figure 2.

Note that exactly the same technique may be used to calculate the positioning of the right-hand margin. However, this is only of value with the *Justify* format option from Ovation.

The 80 Column

Compiled by Alan Wrigley

In last month's *80 Column* I mentioned that it was possible to include codes in your documents which would enable you to set different fonts on your printer. This month I will explain how to do this. In fact, the method to be described is suitable for accessing any printer function that can be switched on or off by means of a sequence of control codes. In addition to extra fonts, you could therefore use it to set double-height, triple-width, non-standard line spacings etc., or just the "normal" functions of bold, italics and underline if these are not supported by the software from which you are printing.

In order to access any particular printer function, you must include a single ASCII character in your text (which must of course be one that does not normally occur), and then make an amendment to the printer driver so that this character will be expanded at the time of printing into the code sequence required by the printer. The examples which follow assume that you have an Epson-compatible dot-matrix printer, but it should be easy to adapt the method for any similar printer by referring to the printer manual.

The most suitable characters to use are those in the range 128-159, since these are normally redundant when using plain text. DeskEdit, for example, uses 128-131 and 136-139 for functions such as bold and italics etc. If you are never likely to need international characters in your text, you could use any of the characters from 160-255. Remember that you will need one code to turn the function on and another to turn it off.

Make a note of which characters you have used for which functions. Now turn your attention to the printer driver. As we have mentioned before in this column, with release 2 printer drivers onwards, it is possible to tell the driver to substitute any ASCII code in a document with another code or sequence of codes when it is sent to the printer (see in particular RISC User 5:3). Open up the printer driver's application directory (*!PrinterDM* in our example), and load the file called *PrDataSrc* into an editor. Close to the start of the file is a section entitled *Default printer definition*, and within this a sub-section called *Printable character translations*.

Now you need to add a line to this section of PrDataSrc for each code you wish to use for accessing printer functions. The line must be of the form:

```
text_charnnn:        <string>
```

where *nnn* is the ASCII code and *string* is the required output string for the printer in GSTrans format (i.e. non-printable characters shown as numeric ASCII codes surrounded by angle brackets). For example, if you are using 128 and 129 to switch bold on and off, and your printer needs the sequence ESC "E" for the former and ESC "F" for the latter, then the lines would read:

```
text_char128: "<27>E"
text_char129: "<27>F"
```

As another example, to set a different font using, say, code 140 in your text and the standard Epson sequence of ESC "k" <fontnumber>, you would insert:

```
text_char140:        "<27>k<n>"
```

into *PrDataSrc*, where *n* is replaced by the required font number. There is no reason why you should not set more than one function at a time with the same code; for example code 159 could set both bold and underline at once:

```
text_char159:        "<27>E<27>-<1>"
```

Finally, save your new *PrDataSrc* and use *PrSquasher* to make a compressed version of it, as described in the printer driver's help file.

Into the Arc: Tiny Obey Files

Keith Powell shows you just how useful short Obey files can be.

Many useful programs can be composed entirely of system commands, and such Obey files are easily prepared with Edit (or similar). The ones shown here are all short, which means that they can be prepared quickly and can be amended without difficulty should you find that you have made an error. Indeed, some Obey files consist of only one word; one consists of just a dot!

CREATING AN OBEY FILE

To create an Obey file first load Edit (which is on the App1 disc supplied with your computer, or on your hard disc). Click Menu over the Edit icon to reveal the *Edit* Menu, slide across Create to reveal the *Create* sub-menu and click on *New Obey file*. A window will appear in which you can now type a list of commands. Remember to press Return after typing the last line. Saving what you have typed into this window will automatically create an Obey file. Use this process with all the Obey files discussed here.

The files can all be run from the Desktop by double-clicking on their icons in a directory viewer. The output of each file will be displayed either in a small Desktop window or within the full screen. You can usually return to the Desktop by pressing a key or clicking Select.

TIME AND DATE

The first Obey file tells you both the time and the date, which is useful when there is no clock or calendar handy. Save this Obey file first with the name of *Time* and then again as *Date* - two files for the price of one. The file consists of just one word:

```
    Time
```

SCREENSAVE AND SCREENLOAD

The two files shown here allow you to save the current screen and to display it later. The screen is saved in the root ($) directory of a floppy disc in drive zero. Save this as *ScreenSave*:

```
    ScreenSave adfs::0.$.Screen
```

The following file should be saved as *ScreenLoad*. With several screens it is best to load them into Paint for viewing, but this file allows you to see a saved screen without loading Paint first.

```
    ScreenLoad adfs::0.$.Screen
```

If you are using a hard disc then replace the sequence *adfs::0.$.Screen* with *adfs::MyDisc.$.Screen* where *adfs::MyDisc.$* is as shown in the title bar of the resulting window when you click on your hard disc icon.

FONT UTILITIES

FontCat - lists outline fonts available for applications which you are about to load.

```
    Echo
<22><12><17><1><17><135><12><14>
    Echo Hold down Ctrl and press Shift
to scroll
    Echo <17><0>
    FontCat
```

If you have not been using fonts the next file will tell you the size of the font cache and how much of it is free. If you have been using fonts it will show those which are resident in the font cache and the amount of memory they consume. Save as *FontList*.

```
    Echo
<22><12><17><1><17><135><12><14>
    Echo Hold down Ctrl and press Shift
to scroll
    Echo <17><0>
    FontList
```

SYSTEM UTILITIES

Status - shows the configuration of your computer.

```
    Echo
<22><12><17><1><17><135><12><14>
    Echo Hold down Ctrl and press Shift
to scroll
    Echo <17><0>
    Status
```

Show - list all the system variables.

```
    Echo <22><12><17><1><17><135><12><14>
    Echo Hold down Ctrl and press Shift
to scroll
    Echo <17><0>
    Show
```

The next file will list the relocatable modules in your computer. Before switching off after a session, run this file and check the module names to ensure that your computer has not been infected by a virus consisting of a relocatable module. Names to watch out for include Extend, Tlodmod, Traphandler and Mymod. Save as *Modules*:

```
    Echo <22><12><17><1><17><135><12><14>
    Echo Hold down Ctrl and press Shift
to scroll
    Echo
    Echo Beware of Extend, Tlodmod,
Traphandler and Mymod.
    Echo <17><0>
    Modules
```

Save the following file as *Unplugged*. If any modules have been unplugged, these will be listed. There are programs around which unplug modules without reinstating them later, causing difficulties with some other applications. Using this file from time to time will warn you of this problem.

```
    Echo <22><12><17><0><17><135><12><14>
    Echo The following shows any
unplugged relocatable modules.
    Echo
    Unplug
    Echo
    Echo To ReInsert an unplugged module
shown above,
    Echo go to the command line (F12) and
use:
    Echo *RMReInit
    Echo followed by the module name.
```

HELP UTILITIES

Help - when run this will display simple help information as a reminder of the help facility available from the command line.

```
    Help
```

Save this file as *HelpSyntax*. It explains the cryptic format of commands in Help displays.

```
    Help syntax
```

The next listing should be saved as *HelpCommnd*. It lists commands available from various sources.

```
    Echo <22><12><17><1><17><135><12>
    Echo Hold down Ctrl and press Shift
to scroll
    Echo <17><0>
    Help commands
```

Save the following file as *HelpFileCo*. It shows the filing system commands.

```
    Help FileCommands
```

The next file should be saved as *HelpModule*. It lists all of the loaded modules along with data concerning their issue, which can be useful when you have two different issues of a module and want to determine which is the latest.

```
    Echo <22><12><17><1><17><135><12>
    Echo Hold down Ctrl and press Shift
to scroll
    Echo <17><0>
    Help modules
```

The HELP command which is available after a prompt in Basic does not work within a Basic program or an Obey file, but it can be used within a Command file. If you create an Edit window of the type known as Command, by sliding across from Create in the Edit menu and clicking on *New Command file*, you can type the following into the window using upper-case letters where shown.

```
    *BASIC
    MODE 12
    REM The following is a list of Basic
Keywords.

    HELP .

    QUIT
```

(yes: HELP, space, full stop). The blank lines above and below this line are not essential, but they improve the format. Save it as *HelpBasic*. A list of the Basic Keywords will appear when you double-click on this name.

DISC UTILITIES

Save the next Obey file as *CurDir*.

Yes, just a full stop followed by a Return! When you double-click on its file name the current directory will be displayed in a small window, but if the directory is large it will overflow it.

Save this version as *CurDirBigW*. It provides a larger window and a reminder of what is displayed. Do not forget the full stop and the final Return.

```
   Echo <22><12><17><0><17><135><12>
   Echo The following shows the contents
of the
   Echo current directory in Command Mode
   Echo
```

The next Obey file is *Floppy*. Use this when you want to search for an application among several floppy discs all of which contain many applications in their root directory. You will be able to see the application names on each disc very much quicker than when you click on the floppy disc icon.

```
   . adfs::0.$
```

Save the following file as *Cur=Floppy*. It will change the current directory to be the root directory of the floppy disc and will display its contents.

```
   Echo <22><12><17><0><17><135><12>
   DIR adfs::0.$
   Echo The current directory is now
the floppy disc
   Echo
   .
```

This file should be saved as *Cur=Hard*. It will change the current directory to be the root directory of the hard disc and will display it.

```
   Echo <22><12><17><0><17><135><12>
   DIR adfs::MyDisc.$
   Echo The current directory is now
the hard disc
   Echo
```

PRINTER COMMANDS

The following files suit many 'Epson compatible' printers - check that the codes suit yours. Ensure that your printer is ready to receive the command before double-clicking on the filename. When you use *BoldOn,* for example, future text will be printed in Bold (if your application does not reset your printer before sending text).

Save the following file as *BoldOn*. It sends ASCII codes 27, 69 to your printer which is ESC E.

```
   FX138,3,27
   FX138,3,69
```

Save the following file as *BoldOff*. It sends to your printer 27, 70 (ESC F).

```
   FX138,3,27
   FX138,3,70
```

Save the following file as *ItalicOn*. It sends to your printer 27, 52 (ESC 4).

```
   FX138,3,27
   FX138,3,52
```

Save the following file as *ItalicOff*. It sends to your printer 27, 53 (ESC 5).

```
   FX138,3,27
   FX138,3,53
```

Save the following file as *PrntrReset*. It sends to your printer 27, 64 (ESC @).

```
   FX138,3,27
   FX138,3,64
```

Save the following file as *Pitch10*. It sends to your printer 27, 80 (ESC P).

```
   FX138,3,27
   FX138,3,80
```

Save the following file as *Pitch12*. It sends to your printer 27, 77 (ESC M).

```
   FX138,3,27
   FX138,3,77
```

Your printer manual will probably show other useful effects you could use.

All of the Obey files (and one Command file) described above are contained on this month's magazine disc for convenience.

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ANSI C Part 15: Writing Module Tasks in C

By Lee Calcraft

AVOIDING THE FATAL CRASH

Last month we looked at how to write relocatable modules in C. If you want your module to behave like a Wimp task, there are two vital things that you must do. If you simply write a module along the lines described last month, and include in it a call to *wimpt_init()* (and link your code with RISC_OSLib), you will get a fatal crash.

THE WRONG RISC_OSLIB

The first error (non-fatal) is that the version of RISC_OSLib that you linked with has not been compiled with the *module* flag on. The one supplied with ANSI C (all versions) has been compiled with the module flag *off*, and by an oversight on Acorn's part, no alternative is supplied. But they have kindly supplied us with a suitable version, and this will presumably be included with future releases of the DDE. If you would like a copy now, see the details at the end of this article.

PROTECTING YOUR WORKSPACE

The second fix requires the module to respond to service call 0x11 (*Service_Memory*). It must do this in order to prevent the Wimp from reclaiming the module's application workspace (which the module uses for all its static memory requirements). This is achieved as follows.

Add the following line into your CMHG source:

```
     service-call-handler: service_handler
0x11
```

This would normally all be on a single line, and will cause any service calls of type *Service_Memory* to be directed to a function in your source named:

```
     service_handler()
```

This name is arbitrary, but must match the name of a declared function in your module source code.

The function itself is extremely short, and takes the following form:

```
void service_handler(int service,
_kernel_swi_regs *r, void *pw)
{
  if (service==0x11 &&
  r->r[2]==(int) Image__RO_Base)
  r->r[1]=0;
}
```

It simply checks whether we have received service call 0x11 and whether the contents of ARM register R2 matches the start address of our module. If so it claims the service call by zeroing register R1 which informs the Wimp that it must leave our workspace alone.

The slightly tricky bit is the external symbol:

```
     Image__RO_Base
```

Note the double underscore after *Image* and that the *R* is followed by capital 'o' not zero.

This supplies the base address of the module, and may be accessed by linking a short piece of code supplied with the DDE in the following file:

```
     User.RMBase.o.Base
```

Just drag this to your *Make* window before linking. You will also need to make the following declaration at the top of your source:

```
     extern int Image__RO_Base;
```

```
;CMHG description file
;for test desktop module

help-string:       Test_Module 1.00

title-string:      TestModule

module-is-runnable:

service-call-handler: service_handler 0x11
```

Figure 1 Complete CMHG description file for the desktop module

You should now find that your module will compile and run properly. The *main()* function of the module will probably look very similar to its non-module counterpart, calling an initialisation function to initialise the Wimp, templates, *dbox* etc., and then moving into an endless *event_process()* loop. Obviously, the way in which you initialise your task will depend on what you want it to do in life - whether it be a normal icon bar application, or an invisible TSR (Terminate and Stay Resident) task such as a virus trapper.

If you write any interesting modules that you think might be suitable for our magazine disc, please drop us a line.

If you would like a copy of Acorn's RISC_OSLib object code compiled for use with modules, please write to the editorial address enclosing a formatted 3.5 inch disc, and an SAE.

? TECHNICAL QUERIES

Alan Wrigley answers your queries on PC Emulator characters, window title bars and system variables.

Q *Dear Sir*
I read in Technical Queries (RISC User 5:9) that you can alter the appearance of the system font. Unfortunately this seems to have no effect when using the PC Emulator, even with the multi-tasking version. Is there any way I can change the appearance of the PC Emulator characters?
Philip Morton

A All versions of the PC Emulator have a file called *Rom* inside the application directory, which is read at start-up. Among other things this contains the full definition of the character set, stored as a sequence of 8 bytes per character. The table starts at byte 5742 of the file, and characters 128-255 precede characters 0-127. It is a relatively simple matter therefore to modify the file so that your own preferred character definitions are stored. The following program will do this:

```
    10 SYS "OS_File",17,rompath$, TO ,,,
,len%
    20 DIM romarea% len%
    30 SYS "OS_File",16,rompath$,romarea
%,0
    40 file%=OPENIN(BBCfontpath$)
    50 REPEAT PTR#file%=PTR#file%+1
    60 char%=BGET#file%
    70 pos%=5742+8*((char%+128)MOD 256)
    80 FOR i%=0 TO 7
    90 romarea%?(pos%+i%)=BGET#file%:NEXT
   100 UNTIL EOF#file%
   110 CLOSE#file%
   120 SYS "OS_File",0,rompath$,,,romarea
%, romarea%+len%
```

where *rompath$* holds the full pathname of the *Rom* file, and *BBCfontpath$* holds the full pathname of the BBC font file you wish to use with the emulator. You should make a copy of your original *Rom* file before you do this, of course, as a safeguard against anything going wrong.

Q *Dear Sir*
My program inputs data into a window using writable icons, but how do I mark the data as modified (with the usual asterisk in the title bar) when the Wimp processes input to the icons automatically?
K. Turner

A Most text editors, word processors etc. do not use writable icons for text input, and so it is quite easy to detect modification since the application is in full control of input. When using writable icons, you have to resort to other methods. You could adopt a simple approach and just update the title bar if necessary each time the caret moves from one icon to the next, since at this point the keypress (Return or cursor up/down) will be reported to your application. This is not really satisfactory, since the user could move from icon to icon with the mouse, and end up inputting a whole window of data which was then lost on quitting the application since the data was never marked as modified. A better method is needed.

At first sight it might seem possible to set the validation string in the writable icons such that *no* characters are allowed, which would result in every character typed being reported to the application. The first key press could then be taken as an indication that the document had been modified. Unfortunately there is one problem with this method - the Wimp processes Delete and Ctrl-U automatically, and there is no way the application can detect these.

The best method would seem to be to use Wimp poll null reason codes to make a quick check on the data. It is much easier to do this if you arrange for the indirected contents of your writable icons to be in one continuous block in memory. Then all you need to do is go through the block adding together the contents of each byte. As soon as the count changes from the last check, the data has been modified and you can mark the title bar. Once it has been modified for the first time, you can ignore the checks until the data is saved or a new document started, so you can mask out null reason codes in the mean time. The code would look something like this (*PROCcheck* would be called in response to a null reason code):

```
DEFPROCcheck
count%=0
FOR ptr%=start% TO end%-4 STEP 4
count%+=!ptr%
NEXT
IF count%<>oldcount% modified%=TRUE
ENDPROC
```

start% and end% are the beginning and end of the block of indirected data, and you would use *modified%* as a flag to determine whether to mark the title bar and to trap requests to quit so that the user is given an opportunity to save the data first. You must of course perform a similar check once when the window or document is first opened or saved, to put an initial value into *oldcount%*.

You will be pleased to hear that this problem no longer exists with RISC OS 3, since you can tell the Wimp to notify you of all keypresses inside icons. For further information, see the article elsewhere in this issue.

Q *Dear Sir*
I am trying to understand how to use system variables, but I am getting confused by all the terminology, such as aliases and macros. Can you help?
F.G. Sykes

A An alias is simply an alternative name for a command, which can be defined (at the command line) by the user in the following way:

```
Set Alias$NewName <command>
```

This creates a new command, *NewName*, which has exactly the same effect as the command given as the last parameter. For example, suppose that you needed to switch the country setting of your computer regularly between UK and France. You could abbreviate the process by issuing the following commands:

```
Set Alias$U Country UK
Set Alias$F Country France
```

Now all you need to do to switch between them is to press F12 to get to the command line, and type either U or F as required.

You can set an alias for any command that can be issued at the command line. For example, if you have a directory called *Documents* buried deep in your directory structure, you could use:

```
Set Alias$D Filer_OpenDir
```

followed by the full pathname of the directory, and then issuing the command *D* will open its viewer.

A normal system variable is assigned a value using the *Set* command, and this value does not change unless *Set* is used again. In some circumstances, however, we may want a variable to change its value dynamically - to take an obvious example, it would be pointless having a variable which holds the current time if it had to be explicitly set every second.

This is where macros come in. A macro is a variable whose value is assigned at the time of use, not at the time it is set. This normally means that its value is taken from another variable which is evaluated each time the macro is read. To take an example, it is possible to set the variable *CLI$Prompt* so that the command line prompt displays a sequence of characters of your choice, rather than the standard asterisk. If you wanted to set the prompt to the current time, you would need to use a macro, otherwise the prompt would simply continue to show the time at which you issued the Set command. So you would use:

```
SetMacro CLI$Prompt <Sys$Time>
```

As a final example, we will combine an alias and a macro to enable you to see the current time by typing T at the command line:

```
SetMacro Alias$T Echo <Sys$Time>
```

WRITE-BACK

NEURAL NETWORK APPROVAL

I would like to let you know that I am strongly in favour of there being more on the subject of neural networks in your excellent magazine.

Ian Mackenzie

At last a scientific application for the Arc. Please include more articles on neural nets if you can. Although I sympathise with you on the problem of magazine space and publishing articles of minority interest, you could, surely, give a bit more space to scientific software.

N.V.Clarke

I would like further coverage, but it would be helpful if such articles also included references to papers or text books (preferably the latter) where one could find further information. It is tantalising to be told merely that the so-called 'Hebbian rule' is used in the program (for example), but to be given no information whatever on where such rules came from.

I.M.Yuille

These are just a few of the many comments (all favourable) which we received on this subject. In view of this response we will be covering Neural Networks again soon. Bibliographies on this topic are problematic: there is no shortage of sources, but they tend to be highly mathematical and not easy to follow. This month's magazine disc contains an interesting *back propagation* program - full documentation is on the disc.

THE MISSING BASIC EDITOR

I have just received my A5000 and feel there are a couple of comments to make. The computer is remarkably fast, so fast indeed that the paged mode for program listings is almost unusable. The answer seems to be to use Ctrl-Shift instead of my previous Shift alone.

As one who works a great deal in Basic, I was horrified that Acorn has not supplied its Basic editor with the A5000. The use of Edit, while it has some handy features, is made impossible by the dreadful cursor. By the time I have set up my favourite colours (yellow on blue) the cursor is nearly invisible. Fortunately I have an old A440, and the BasicEdit module transferred from there works fine. Perhaps you could suggest to Acorn that they supply BasicEdit on one of the applications discs.

Peter Lloyd

A number of readers have expressed their preference for the old Basic editor. However, as far as we know Acorn has no plans to make this available now that Edit (under RISC OS 3) will accept Basic programs direct. For a much more comprehensive solution we suggest you consider DeskEdit 2, which has many enhanced features specifically geared towards the needs of Basic programmers, and much more besides.

PCOL PROBLEM SOLVED, AND A QUERY

I notice in **Write-Back** *(RISC User 5:9) that your correspondent Hedley Hunnisett is having problems with my multi-column print utility, PCol, on his A5000. The reason is that the program utilises the TOKENADDR routine to access the table of Basic tokens held in the Basic ROM. The entry point for this depends on the version of Basic used, and is read when the code is assembled.*

The solution is simple - reassembling the program on the A5000 will read and insert the correct address for that machine. Still on the subject of the A5000 and printers, has anyone devised a printer on-line check to replace the use of ADVAL(-4) which causes the machine to hang?

Doug Tuddenham

PC EMULATOR PROBLEMS WITH QUICK C AND BASIC

Your article on MS-DOS 5 (RISC User 5:5) prompts me to mention a problem I have encountered with Quick C and Quick Basic (the version which includes a compiler, otherwise similar to QBasic) when used with the PC Emulator.

I have used both languages successfully when communicating with friends in the USA who are unfortunate enough not to have an Archimedes. This was with v1.6 of the Emulator, and I now find that with v1.8 neither works satisfactorily. The problem appears to be with the editor. I have raised the matter with Acorn who agree that the problem exists, and say that it has been logged for attention in a future version; in the meantime they advise that I should revert to v1.6!

W.B.Hall

HELP AT HAND FOR THE BJ10EX PRINTER

I write in reply to Barry Tattersall (see ***Pin Board*** *in RISC User 5:8) who is experiencing problems with a Canon BJ0ex printer in 1st Mail Plus and with 1st Word Plus.*

I use a Canon BJ300 and have had no problems once I had written a proper printer driver for the Canon, which can emulate an IBM Proprinter X24E (Mode 1) or an Epson LQ850 (Mode 2). Since graphics printing is far superior in IBM mode, this is for me the preferred setup. The BJ10ex emulates the same printers, so I presume that my customised driver will work for that printer as well. I enclose a copy of the driver text source.

There are other modifications which can be made to the driver. By using the alternative commands for 10, 12, 17, and 6 characters per inch, and substituting printer commands for, say, the characters for 1, 2 and 3 on the 1stChars utility it is possible to change font (the BJ300 has three fonts, Courier, Gothic and Prestige) - see CBJet_300y driver enclosed.

The specific problem mentioned by Barry Tattersall is that of printing labels. There does seem to be a problem with the detail in the 1st Word Plus manual (Release 2, p.122-123). As far as I can see the program labelform will not work, since a formfeed will be given after each row of labels. However, if the program is modified to remove the page breaks then it works for sheets of labels, whether in single or multiple column. You must adjust the number of lines per label according to label depth, and a conditional page break must be present to prevent part of an address being printed at a page bottom.

R.Foden

We can supply a printed copy of Mr.Foden's printer driver listings on receipt of an SAE of at least A5 size.

RE-INKING RIBBONS AND OTHER MATTERS

As far as re-inking of ribbons is concerned (see Write-Back in RISC User 5:8) I related the problem (in my phone call) to the jamming of the ribbon within the mechanism. This, according to a manufacturer to whom I spoke, is a result of too much ink being applied. He is of the opinion that trial and error with differing amounts will result in a successful conclusion - eventually. Whether I have the time and patience for such an exercise only time will tell. For the moment I am buying new ribbons - John Heaton's remarks have been noted.

On the question of object-oriented extensions, I am amazed that no one thought to mention Smalltalk. This has been available on Acorn machines for about two to three years now. Expensive, I know, but the only solution. Why Acorn consistently refuse to channel their ideas down the logical route amazes me also. To have added extensions to their Desktop C compiler to align it to, say, Microsoft or Borland C++ would have taken little further work in the upgrade from Release 3. It would have had the advantage of truly allowing owners of Acorn machines to feel better than just second best. The *same goes for Prolog. The future of AI now looks to be with this language. Acorn's own compiler, I believe, has been withdrawn (*).*

Acorn can no longer afford to treat the road that 95% of computer users and manufacturers are treading as taboo. We need these tools, and if third parties cannot be coerced into producing the goods, then Acorn must do it themselves one way or another, but please don't re-enact the 1st Word Plus fiasco.

R.C.Docker

* An alternative, Keylink Prolog v2, is available from Keylink Computers Ltd., 2 Woodway House, Common lane, Kenilworth CV8 2ES, tel. (0926) 50909, price around £85.

TECHWRITER UPDATE

The version of TechWriter I reviewed in RISC User 5:9 was a pre-release version which lacked a few desirable features. I've now had a chance to try out the first production version (v1.01), and I can confirm that all minor problems have vanished.

My main concern was the way in which TechWriter left files 'open' as you worked on them. The production version now provides a user setting to define a size below which files are normally kept closed. This makes working with floppies much quicker. Icon Technology has also taken on board a few minor suggestions which I and others made to improve operation generally. The changes are small but significant. They make the program easier to use, but they also confirm that Icon Technology takes their customers seriously. It all confirms my conclusion that TechWriter is an excellent product which thoroughly deserves to succeed.

Jim Lesurf

PIN BOARD

HELP WANTED BUFFERING STAR PRINTERS

I use an Archimedes 440/1 and Ovation DTP to produce reports and newsletters printed, until recently, on a Panasonic KX-P1080 9-pin printer. I acquired a Star LC24-200 colour printer to replace the Panasonic, and here my problems started. When printing Ovation documents on the Panasonic, I used *PrinterDM* and a software printer buffer *PrBuffer* or *PrintBuff*. This allowed printing to go on in the background, while returning the computer to my use in a matter of seconds. When I try using the Star printer with *PrinterLC* and either *PrBuffer* or *PrintBuff*, the buffer does not appear to work, and printing takes up to 20 minutes at high resolution. I have tried using *PrinterDM* with the Star printer but the configuration is wrong. Can anyone suggest a buffer for use with *PrinterLC*, or a modification of either the buffer or driver, to overcome this?

Mark Empson

101 THINGS TO DO WITH A DEAD ARM

I recently upgraded my A420/1 with a user-fit ARM3 chip. The process of removing the old ARM2 was awkward and fiddly, but I eventually got it out unharmed, give or take a scratch or two. The ARM3 went in easily, and the computer functioned admirably, but I was left with a sad little ARM2 chip; to this day all it can do is sit in the ARM3 packaging, because it seems a shame to throw away what was, until a few years ago, a revolutionary piece of electronics.

Even worse, with the arrival of RISC OS 3 upgrades, my ARM2 will soon be joined by RISC OS 2. Have any readers out there got any good ideas about what to do with these chips?

Ben Avison

RISC User Public Domain Library

★ *NEW LOW PRICES* ★ *NEW LOW PRICES* ★ *NEW LOW PRICES* ★ *NEW LOW PRICES* ★

Our Public Domain discs contain as near as possible to 800k (and not less than 700k). Each disc includes a 'Read Me' file, and there are some instructions with the programs. The discs are offered as seen and are available to RISC User members only for the low price of *£1.60.*

To order tel. 0727 40303, fax 0727 860263, or write (quoting memb. no) to:
RISC Developments, 117 Hatfield Road, St. Albans, Herts AL1 4JS.

★ NEW ADDITIONS TO THE RISC USER PD LIBRARY ★

GRAPHICS

PD45 Disc UPDATED

Contains two applications, Creator and Translator, which allow the exchange and display of graphics picture files between the Archimedes and other computers. Along with these are some high quality demo pictures. Also, included, are a mode converter and a mode utility allowing multisync modes to be displayed on a non-multisync monitor.

PD51 Disc

Contains a set of fractal demos par-excellence. Dazzling!

DRAWING AND ART

PD41 Disc UPDATED

Contains four applications: 'Display' allows the display of Draw files by dragging them into a window. 'Drawplus' is an object oriented drawing package that may be used as an alternative to Acorn's Draw supplied with your Archimedes or A3000. Drawplus has many enhancements over Draw. 'Drawstrip' is a program to enable the easy creation of function keystrips using Draw. 'Drop' enables Draw files to be rotated in 3D and then saved again in their new perspective.

GAMES

PD48 Disc

Contains a demo version of the game Bambuzle from Arxe Systems.

CLIP ART AND PICTURES

PD49 Disc

Contains 69 varied sprite pictures for use in DTP etc.

Public Domain Special Collection

The selected PD software listed below was fully described in Simon Burrows' article on the PD scene in RISC User 5:7 (June 1992).

PDX1	**Draw Plus** **Label**	Extended Draw Label printing
PDX2	**Address D** **AGP** **Daily** **Draw Cross** **Memphis** **Translatr**	Address labels Advanced graph plotter Screen clock Crossword generator RAM filing system Graphics image converter
PDX3	**ArcFS** **Risc BBS** **Impulse II**	Decompression utility Bulletin board system Inter-task communication
PDX4	**ArcFS** **PVray**	Decompression utility Ray tracing
PDX5	**Hangman** **Interface** **Menus**	Classic game Classy Wimp display Wimp Menu editor

These discs are still available at the standard price of **£1.60** (inc. VAT and p&p).

Public Domain Special Collection

UTILITIES AND APPLICATIONS

PD50 Disc

Contains 29 disc utilities. Access sets multiple file /directory attributes, Bin is a dustbin utility, ChDir changes directories, Compact provides a full disc compacter, Compare allows comparison of two files, Dir sets the current directory, DiscCat is for maintaining a catalogue of your floppies, DiskEdit is a disc sector editor, DiscUtils is a disc copier, Disk Clone is another disc copier, DiskTree shows tree directory stucture of any disc, Dpacker is a disc compression util, Dustbin is yet another bin utility, FileAct performs various actions to files dragged to it's icon, FileFind is self-explanatory, Filer is a general disc utility, Filetype changes filetypes from the Desktop, Filetypes sets types and stamps files, Go moves to any directory, GuessType will try to guess the type of a file dragged to it's icon, Locksmith allows locking of directories, Menon is a sticky backdrop-type menu application, NewSet-Ty is another settype util, Options allows easy change copy and wipe options, Stamp is a Desktop filestamper, and finally, StickyBD is a sticky backdrop program.

PD52 Disc

Contains DiscInfo, a program that provides extensive infor-mation about any disc, ExtFiler allows control of various filing functions, GraphDraw is self-explanatory, and finally, Unimode is a sophicticated screen mode generator.

PD54 Disc

Contains Dimwit a screen saver program, DosFS allowing reading and writing of DOS discs, GreyEdit for editing 256 greyscale images, Larger for making your Desktop - yes, larger! PickaPic a sprite selection database, SetTime yet another Desktop clock, Showtrack a spectrum analyser, SprEd a sprite editor and StrongEd, a powerful text editor.

PD55 Disc

Contains Appdock, a kind of sticky backdrop, a Desktop clock called ArmClock, Filetypes that will try to recognise filetypes,a memory checker called Free,a utility called Headphone to allow control of speakers and headphones, an IconClock,a Memory editor,a util called ModeInfo that gives details about current screen mode,a sound Module player,a program called Packdir which packs directories, a RAM disc controller,and finally, a utility to delete all data on a floppy quickly without using Delete or re-formatting.

FONTS

PD53 Disc

Contains 13 RISC OS 3 fonts and a few 'filler' programs including a graphic adventure and an electronic index to the RISC OS 2 PRMs.

Sampler Disc (PDS1)

Contains the following sample programs from our Public Domain Software Library:
SoundTracker, Accounts, SC Label, Follow, Hangman, Multiprint, Rotate, STD and Wanda

All other PD discs remain available

HINTS & TIPS

Don't forget to keep sending in your hints on anything relevant to the Archimedes range, and remember, we pay for all hints we publish.

MAXIMUM NUMBER OF FONTS IN *SHOWFONTS*

Mark Moxon

The ShowFonts application, published on the RISC User disc for Volume 5 Issue 9, has a maximum number of fonts it can cope with. This is set to 200 in the version on the magazine disc, but this can be altered easily by changing the size of the array *font$* in line 450 of *!RunImage*. The size of the memory block *fonts%* in line 430 should also be altered so the font menu can be created in memory. For a value of 200 fonts, I assumed that each font name would fit into 80 characters, and 200*80=&3E80 which is nearly &4000, the value used. If you increase the number of fonts you want to use, then you should increase the value of *fonts%* in a similar way.

TEMPLATE EDITOR COPY BUG

Lee Calcraft

The Template Editor (version 1.15) has an annoying bug in its Copy routine. If you elect to copy a template (using the Copy entry in the menu) so that you can edit the second version as the basis for a new template, you will find that both copies have been edited, so that the original is completely lost.

The way around this is to make the copy, then save the templates file, and then load it back in again for editing.

PSEUDO-FILING SYSTEMS

David Spencer

RISC OS allows any number of pseudo-filing systems to be created by setting the system variable *name$path* to the full pathname of a directory followed by a '.', where *name* is the name of the new filing system. Thereafter, the specified directory becomes the root directory of the new filing system. For example, if the command:

```
*Set Test$Path adfs::4.$.Code.
```

was issued, then the filename *Test:Prog1* would refer to the file *adfs::4.$.Code.Prog1*, and *Test:old.Prog2* would refer to the file *adfs::4.$.Code.old.Prog2*. The value of the variable can be thought of as a prefix that is appended to the front of the given name, hence the need for the dot.

This in itself is of limited value, except in reducing the lengths of pathnames, but the real power is that the path variable can be set to a number of different directories, separated by commas. RISC OS will then search each one until the file is found. This allows files in several different places to be grouped together. For example, the C compiler uses a pseudo-filing system C: to find its libraries, which could be spread all over the place.

MARKING IN *OVATION*

Lee Calcraft

If you need to save a small part of a large document, perhaps because it has become too long to back up to disc, this is rather awkward to do in Ovation. You cannot simply mark the bit you are interested in, and perform a save. You must delete the bits you do not want to save, and save the remainder.

Fortunately there is a quick way to mark large tracts of text. Mark the first few lines of the section you want to mark, and use Page Down or Shift-Page Down to get to the end of the block that you are interested in. Then click with Adjust, and the job is done.

YAHTZEE RULE CHANGE

Mark Moxon

The Yahtzee game published on the RISC User disc for Volume 5 Issue 9 follows one variety of the rules, but they are not the most common set. The most common rules state that a *Small run* is a run of four consecutive numbers (not 1,2,3,4,5 as in the disc version), and a *Large run* is a run of five consecutive numbers (not just 2,3,4,5,6). To implement this version of the rules, add the following lines to the *!RunImage* program:

```
  2190 WHEN 11
  2191  IF num_of%(1)>0 AND num_of%(2)>0
AND num_of%(3)>0 AND num_of%(4)>0 THEN va
l%=30
  2192  IF num_of%(2)>0 AND num_of%(3)>0
AND num_of%(4)>0 AND num_of%(5)>0 THEN va
l%=30
  2193  IF num_of%(3)>0 AND num_of%(4)>0
AND num_of%(5)>0 AND num_of%(6)>0 THEN va
l%=30
  2200 WHEN 12 : IF singles%=5 AND (num_o
f%(1)=0 OR num_of%(6)=0) THEN val%=40
```

This gives a score of 30 for a Small run and a score of 40 for a Large run. One final point is that in some implementations the score for a Yahtzee is independent of which numbers make up the Yahtzee. To change the score to, say, 100, change line 6470 to:

```
  6470 DIM yahtzee%(6):yahtzee%()=0,100,1
00,100,100,100,100
```

SWAPPING REGISTERS IN ARM CODE

Alex Belton

Despite the fact that the ARM processor has an enormous number of registers, as every programmer knows they are never enough. Saving registers is always at a premium, so being able to swap two registers without using a third can come in handy. Normally, to swap R0 and R1, say, a temporary register is used:

```
    MOV tempR,R0
    MOV R0,R1
    MOV R1,tempR
```

However, the following code takes the same amount of space and time, yet requires no temporary register:

```
    EOR R0, R0, R1
    EOR R1, R0, R1
    EOR R0, R0, R1
```

DESKEDIT AND THE FAX PACK

Lee Calcraft

Versions 2.05 and later of Computer Concepts' Fax Pack may be used to send faxes directly from DeskEdit. You will need to use a text height of 66 in DeskEdit's Page Setup dialogue box (Fax Pack does not currently support other text heights), and you will probably want to use a relatively short header (again, as set up in the Page Setup dialogue box).

To send a fax, simply install the Fax manager and driver on the icon bar, and press the Print button from within DeskEdit (optionally using an embedded telephone number). CC's drivers do not yet support 1st Word Plus printer codes, so if you have used any style codes within your DeskEdit text file, they will appear as dots on the resulting fax.

TEMPLATE ICON ALIGNMENT

Mark Moxon

Aligning icons in the Template Editor can be a bit of a headache, but there is a simple solution at hand. Open a window (preferably one which you can resize) and use this as a ruler to align the icons. If the edge of the window is put right up against one icon, then it is easy to see which icons are out of line and how they need correcting.

VERSION OF RISC OS REVISITED

Peter Sowerby

An easier method of finding the version of RISC OS in use (see Hints and Tips 5:9) is to press F12 and type *FX0. The information given is the same as with *Help Modules, but it is more clearly displayed.

MOVING AND ALIGNING ICONS IN *FORMED*

Lee Calcraft

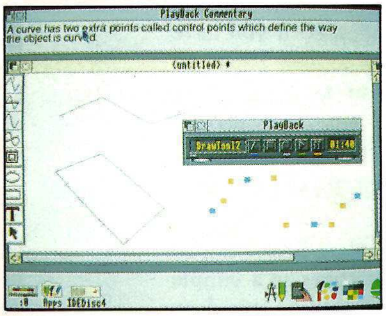
If you find yourself aligning icons in FormEd by dragging them to their required positions, there is a much easier way. Simply use the Move entry in the icon's menu, and set its x and y co-ordinates as required. This has two massive advantages: you don't have to make the icon draggable to perform the operation, and you can achieve much greater accuracy than by adopting the freehand approach.

Note also that if you are experimentally positioning an icon, you can use the Adjust button to enter new co-ordinates. This means that the menu stays open and you can continue to fine-tune the position of your icon until it is correct. If you are doing this, you may find that the caret disappears from the input icon after each value has been entered. To restore it, just move the pointer above the icon and then bring it back (without pressing any buttons).

NEW

PlayBack

Real-time mouse recorder


PlayBack Commentary

A curve has two extra points called control points which define the way the object is curved

PlayBack allows recording in real-time of all mouse and keyboard operations as they are carried out. This new package will produce intriguing and eyecatching displays that will be of interest to home, education and business users as well as for training. It is an ideal tool for creating demonstrations of programs which run in the desktop.

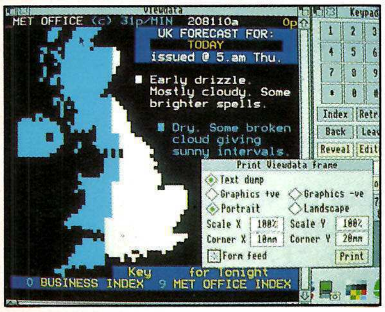
During a computer session, all mouse operations and key presses may be recorded and saved to file. On playback everything will happen in exactly the same way, with the mouse pointer following all of the recorded movements and button clicks, and text appearing on the screen as if typed from the keyboard. Playing back a recording is exactly like carrying out the session again!

Members price £18.98

- Synchronised text commentary may be added to recordings
- Recordings may be converted to ASCII format for editing and fine-tuning
- Play-only version which may be freely distributed with recordings
- Recordings may be up to 1 hour long
- REPEAT operation for continuous demonstrations
- Works with all RISC OS compliant desktop software
- Supplied with example recordings

Hearsay II

The most advanced communications package for Archimedes systems.


```
MET OFFICE (c) 31p/MIN  208110a
UK FORECAST FOR:
TODAY
issued @ 5.am Thu.
■ Early drizzle.
Mostly cloudy. Some
brighter spells.
■ Dry. Some broken
cloud giving
sunny intervals.
Key     for Tonight
0 BUSINESS INDEX  9 MET OFFICE INDEX
```

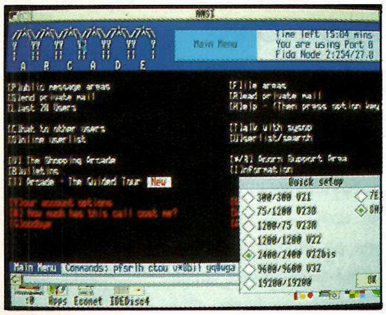
Print Viewdata frame

- ◈ Text dump
- ◇ Graphics +ve ◇ Graphics -ve
- ◈ Portrait ◇ Landscape

Scale X 100% Scale Y 100%

Corner X 10mm Corner Y 20mm

☐ Form feed


```
A R C A D E                 Main Menu     Time left 15:04 mins
                                          You are using Port 0
                                          Fido Node 2:254/27.0

[P]ublic message areas                    [F]ile areas
[S]end private mail                       [R]ead private mail
[L]ast 20 Users                           [H]elp - (Then press option key

[C]hat to other users                     [T]alk with sysop
[O]nline userlist                         [U]serlist/search

[V] The Shopping Arcade                   [*/3] Acorn Support Area
[B]ulletins                               [I]nformation
[!] Arcade - The Guided Tour New

[Y]our account options
[$] How much has this call cost me?
[G]oodbye

Main Menu Commands: pfsrlh ctou v*0bil yq#wga
```

Quick setup

- ◇ 300/300 V21
- ◇ 75/1200 V23O
- ◇ 1200/75 V23A
- ◇ 1200/1200 V22
- ◈ 2400/2400 V22bis
- ◇ 9600/9600 V32
- ◇ 19200/19200

Hearsay II is a multi-tasking and fully RISC OS compliant communications package designed for easy communications for the first-time user, but with a wide range of advanced features making it the professionals choice.

It is ideal for use with Prestel, Telecom Gold, Campus 2000 and Compuserve, and also provides very high quality VT320, VT102, VT52 and Tektronix 4105 Colour terminal emulations for direct connection to mini and mainframe hosts.

In addition it gives access to Minitel systems such as the Teletel service and provides Xmodem, Ymodem, Zmodem and Kermit file transfer, an comprehensive script language and an auto-dial number directory.

Members price £74.91

- Fully RISC OS compliant
- Multi-tasking and background transfers
- Scalable terminal windows
- Xmodem, Xmodem1K, Ymodem, Zmodem, Kermit, SEAlink, and ASCII file transfer
- Batch file transfer
- Script language based on a subset of C
- Macro processor and definable keyboard
- Support for RISC OS printer drivers
- Number directory with auto-logon
- MNP 2 and Vasscom error correction
- Supports most popular modems e.g. Hayes
- Online GIF file viewer

Upgrade to version II

Upgrade from Hearsay I for only £41.13 plus £3.10 carriage. Please return original disc to address below.

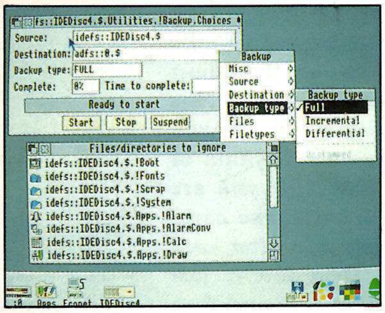
'It does everything we want, and is a pleasure to use.' ARCHIVE Jan 92

'Background data transfer, a well documented script language and high RISCOSity make this a powerful contender...' ARCHIMEDES WORLD April 92

'...the manual is an excellent example of thoroughness and clarity...Hearsay II is a very good communications package and is thoroughly recommended...' ACORN USER May 92

Hard Disc Companion II

Hard disc backup and retrieval


fs::IDEDisc4.$.Utilities.!Backup.Choices *

Source: idefs::IDEDisc4.$

Destination: adfs::0.$

Backup type: FULL

Complete: 0% Time to complete:

Ready to start

Files/directories to ignore

```
idefs::IDEDisc4.$.!Boot
idefs::IDEDisc4.$.!Fonts
idefs::IDEDisc4.$.!Scrap
idefs::IDEDisc4.$.!System
idefs::IDEDisc4.$.Apps.!Alarm
idefs::IDEDisc4.$.Apps.!AlarmConv
idefs::IDEDisc4.$.Apps.!Calc
idefs::IDEDisc4.$.Apps.!Draw
```

Version II of Hard Disc Companion offers superior performance and efficiency. It has been completely re-written and is now twice as fast and even easier to use.

It provides a structured approach to the backing up of hard drives, and the recovery of files in the event of disc failure or accidental file deletion. Both Full and Incremental backups are supported, and the files to be backed up or ignored may be specified using simple drag operations.

Members price £44.94

The entire backup specification may be saved in a script file for use at a later date. Hard Disc Companion II uses an efficient compression system to backup as much data as possible onto the floppies without increasing the backup time.

Separate applications are included to restore entire backups or just selected files.

Upgrade to version II

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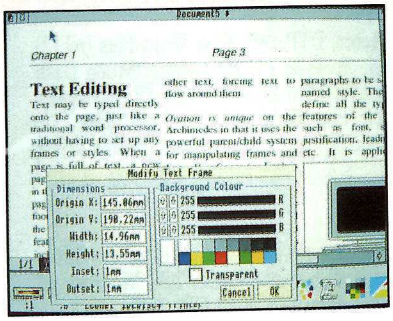
'Good value for money...A nearly foolproof interface...Hard Disc Companion keeps things simple and as fast as possible...' MICRO USER May 92

'...it is certainly the best hard disc backup utility that I have ever used.' ARCHIVE Apr 92

NEW

Ovation 1.30

Announcing a major new release of the highly acclaimed desktop publisher


Chapter 1 Page 3

Text Editing

Text may be typed directly onto the page, just like a traditional word processor, without having to set up any frames or styles. When a page is full of text, a new

other text, forcing text to flow around them

Ovation is unique on the Archimedes in that it uses the powerful parent/child system for manipulating frames and

paragraphs to be s named style. The define all the ty features of the such as font, justification, leadi etc. It is appli

Modify Text Frame

Dimensions

Origin X: 145.06mm

Origin Y: 198.22mm

Width: 14.96mm

Height: 13.55mm

Inset: 1mm

Outset: 1mm

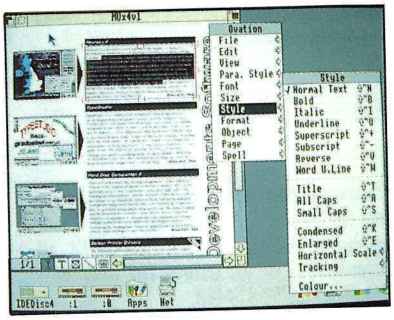
Background Colour

R: 255

G: 255

B: 255

☐ Transparent



Ovation is the easy-to-use desktop publisher used on thousands of sites in education and business across the country. Now, in response to customer feedback, it has been enhanced with many new features, setting even higher standards of quality and value.

Members price £98.88

Ovation is packed with professional features, yet remains easy-to-learn and instinctive to use. It provides a complete solution for all document generation; from simple single page letters to entire books with diagrams and scanned images.

For the users convenience, Ovation is NOT copy protected.

New features

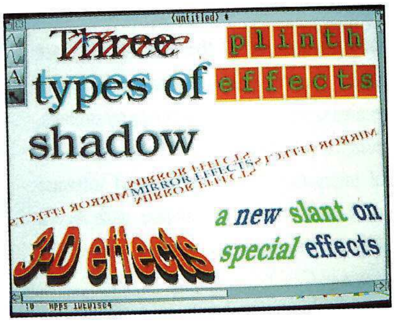
- ☐ Mail merge—Ovation documents may be merged with CSV files generated by databases and other applications
- ☐ Pamphlet printing—scaled and rotated printout for printing booklets with correctly ordered pages
- ☐ Rotated pictures—draw files may be rotated to any angle (also Sprites if you have RISC OS 3.0)
- ☐ 1st Word Plus import—1st Word Plus files may be imported with style information directly into Ovation
- ☐ Thesaurus hotlink—automatic transfer of words between Ovation and latest Desktop Thesaurus (version 1.10)
- ☐ Draft printing—fast draft printing via RISC OS printer drivers
- ☐ System font—easy-to-read non anti-aliased system font in four weights (medium, bold, italic and bold italic)
- ☐ RISC OS 3.00 compatibility—rotated text in Draw files, 256 grey-level sprites and the desktop boot facility

Upgrade to version 1.30

Upgrade to version 1.30 for just £5 + VAT + £1 carriage (£6.88 inclusive). Please return your original program disc to the address below.

TypeStudio

The flexible text effects package



TypeStudio is a complete text manipulation package ideal for producing professional quality adverts, posters, banners, logos, letterheads etc.

Drawing tools allow lines and curves to be drawn to create almost any shape, along which text can be flowed. Pairs of lines may be linked to create shapes into which text and Draw files may be moulded.

Members price £44.94

A range of special effects are available, including: shadow, slant, 3D and mirror.

- Flow text along straight and curved paths
- Mould text and Draw files to shapes
- Wall floor and graduated shadows
- 3-D, mirror, slant and plinth effects
- Save in internal and Draw file format
- Print using RISC OS printer drivers
- Grid and zoom facilities
- Copy, rotate and magnify
- Import Draw files as moulds

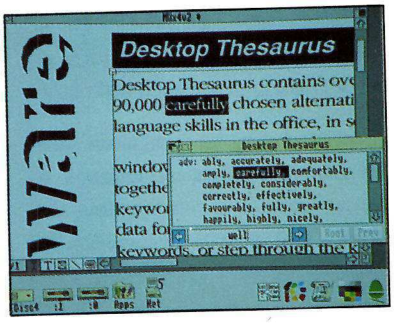
The package includes 7 fonts and a 64-page user guide containing many worked examples.

'Of the three (packages), TypeStudio is the most comprehensive. All the tools you are likely to need are included and there is no need to use any other application with it.' ACORN USER May 92

New Version

Desktop Thesaurus

New, bigger thesaurus with hotlink to Ovation


Desktop Thesaurus

Desktop Thesaurus contains ove
90,000 carefully chosen alternati
language skills in the office, in s
windov
togethe
keywor
data fo
keywords, or step through the k

Desktop Thesaurus

adv: ably, accurately, adequately, amply, carefully, comfortably, completely, considerably, correctly, effectively, favourably, fully, greatly, happily, highly, nicely,

well

Desktop Thesaurus now contains over **13,750** keywords and nearly **135,000** synonyms. It is ideal for developing language skills in the office, in school or at home.

Members price £18.98

Ideal for use with Ovation, Impression, Pipedream, Edit, 1st Word Plus and other desktop publishers and word processors.

- Synonyms are grouped by noun, verb etc.
- Single click to browse through synonyms
- Data compressed to save disc space
- Chosen synonyms may be transferred instantly to other applications

Upgrade to version 1.10

Upgrade to version 1.10 for just £2 + VAT + £1 carriage (£3.35 inclusive). Please return your original disc to the address below.

'...works both speedily and painlessly. This one is recommended.' ARCHIMEDES WORLD Jul 92

RISC developments

RISC Developments Limited. 117 Hatfield Road, St. Albans, Herts. Al1 4JS. To order, or for more
All software is suitable for Acorn systems with 1Mb RAM and RISC OS 2.00 or 3.00.
Prices include VAT but please add carriage of £3.10 for Ovationand Hearsay, and £2 for other products (un
All prices are for single user versions—site licence prices available on request.

Personal Ads

Southampton Archimedes User Group - meets on the second Monday of each month, 7-9pm, in term time at Itchen College, Middle Road, Bitterne, Southampton. A very informal meeting and new members are welcome. Contact Ted Lacey on (0703) 552475 for details or just come along.

PC Emulator V1.6 with DOS 3.3 £45, Impression II V2.17 £90, Timeworks DTP for MSDOS £35. Tel. (0232) 457687 after 6pm.

A310 (1Mb RAM) with colour monitor 4 slot backplane, manuals and plenty of software (inc. Learning Curve) £525 o.n.o. A410/1, 4Mb RAM, 40Mb IDE hard drive, manuals and software £1000 o.n.o. Armadillo A448 sampler card and software £70 o.n.o. Tel. 071-703 5675.

Star Laserprinter 8, 1Mb memory, up to 8 pages p.m. no problems with printer drivers when used with Archimedes, perfect condition with manuals and lead £500. Tel. 051-606 0289.

Flexfile £50, Acorn DTP £40, First Word Plus (rel. 2) £35, Inertia £5, 'E' Type £5, Bug Hunter/Moon Dash £5, Arcpinball £10, Mad Prof. Mariarti £8, Pipemania £8, Nevryon £8, Elite Gold £25, The Last Ninja £15, Sparkfs £12, Star/Epson/Citizen colour printer driver £10, Panasonic KX-P1081 printer £50. Tel. (0277) 625613.

Acorn Multisync monitor (AFK18), excellent condition, hardly used, original box and leads £200. Write to: 63 Cromwell Road, Canterbury, Kent CT1 3LE.

The Wimp Game £10, also is anyone out there interested in swapping some PD. Tel. (0742) 588564.

A3000 with 2Mb RAM plus serial chips and WW+ and other software all fully documented. Offers to Tel. 021-744 6507.

Unwanted birthday present: Saloon Cars Deluxe (brand new) £29, Enter the Realm £19, Cataclysm £19, Twin World £9, Bug Hunter In Space £6, No Excuses £4, all in excellent condition, or all games for only £75 (normally £135). Tel. (0279) 814448.

Points Arising

SWI NAME/NUMBER CONVERTER

(Volume 5 Issue 6)

The application can halt prematurely if it finds a &FF code before the end of the Basic file. To overcome this problem add the following lines to *!RunImage:*

```
     1160 REPEAT:count%=line%?3:ptr%=lin
e%+3:REPEAT:ptr%+=1
     1240 UNTIL ?ptr%=13 OR nomem%
     1260 UNTIL ptr%?1=255 OR nomem%
```

MODULE INFORMATION APPLICATION

(Volume 5 Issue 4 Disc Only)

If the screen mode is changed while running the above, the application will give an error. Line 1120 should be changed to:

```
     1120 WHEN 9:PROCgetmodeinfo
```

o prevent the help information eing hidden by extra characters (as displ [illegible] he printer drivers on a [illegible] les, for example), change line

```
[illegible] lp$,34))
```

FREELANCE PROGRAMMERS

RISC Developments are one of the leading software publishers in the Acorn marketplace, and due to expansion have a number of vacancies for programmers. We require freelance programmers to work from home on a number of interesting new hardware and software projects. You will need to be fully familiar with Acorn 32-bit RISC OS computers, and capable of writing WIMP applications in C.

Additionally, if you have any ideas of your own for interesting software projects, we would like to hear from you. We would be pleased to consider your proposals at whatever stage they currently stand, whether just an idea, partly written or completed. Any ideas or submissions will be treated in the strictest confidence.

If you are interested in joining our team, please write with details of your capabilities and interests. If possible, please send samples of your programs, and indicate the amount of time you might have available for this work.

The Software Manager
RISC Developments Ltd.,
117 Hatfield Road, St. Albans,
Herts AL1 4JS

EVENT MASK HOWLER

Sanjay Pattni

Both ANSI C manuals for releases 3 and 4 (pages 288 and 222 respectively) give wrong and misleading examples with the description of the C function *event_setmask()*. Because the 'M' (for Mask) is missed out of the names used, the examples will fail (though without any obvious indication as to why).

The example reads:

```
    event_setmask(wimp_ENULL |
                          wimp_EPTRENTER)
```

when it should read:

```
    event_setmask(wimp_EMNULL |
                         wimp_EMPTRENTER)
```

The result of this is that the function would be passed a value of 5 instead of 33.

dbox WINDOW HANDLES

Richard Lancaster

When using a *dbox* for simple operations it is not normally necessary to know its window handle. If you need to claim NULL events, however, or hang menus from it then the handle needs to be found. This can be achieved by the use of the function *dbox_syshandle()*.

WHAT THE "NEEDS HELP" BIT DOES

David Pilling

In FormEd it is possible to set a *needs help* flag for each icon. The obvious interpretation of this is that if you have an icon that needs help in redrawing, you set this bit, and will get redraw messages from the Wimp. This is not so. To get redraw messages, you must clear the *auto redraw* flag for the whole window. You then get redraw messages for the entire window, and have to sort them out.

What use is the *needs help* flag then? Suppose you have an unfilled icon containing text which needs changing. The conventional ways of writing text to this will not erase the old text. The solution to the problem is to set the *needs help* flag. Any updates to the icon will then do a redraw of the background first.

C Notebook

Compiled and Linked by Lee Calcraft.

Another common requirement for the *needs help* flag is where you are constructing an icon with an indirected sprite. By changing the sprite name pointed to, you hope to change the icon. Again, unless *needs help* is set, the old sprite will remain after the update. Incidentally the way to force a refresh of an icon, is to use the *wimp_set_icon_state()* function with the last two parameters set to zero.

dbox DOUBLES

Tony Shew

The following two functions allow doubles to be used with *dbox* fields:

```
    double get_dbox_double(dbox d,int
                                field)
    {
      char temp[32];
      dbox_getfield(d,field,temp,32);
      return atof(temp);
    }

    void set_dbox_double(dbox d,
          int field,double value,int
places)
    {
      char temp[32];
      sprintf(temp,"%.*f",places,value);
      dbox_setfield(d,field,temp);
    }
```

The first is called with two parameters: the *dbox* structure, and the field number to read from. The second is called with four: the *dbox* structure, the field number to write to, the value to be written and the number of decimal places to display

Please send us y[illegible] C [illegible]
published hints will be paid fo[illegible]

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RISC User is available only on subscription at the rates shown below. Subscribers to RISC User may also take out a reduced rate subscription to BEEBUG (the magazine for the BBC micro and Master series).

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Disc Subscription Rates	UK	Overseas
Six months subscription	£25.50	£30.00
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Last month's special offers on back issue discs and magazines are being maintained. All issues are currently still in stock except Volume 1 Issues 4&5 magazines. All subject to availability. Please include postage when ordering.

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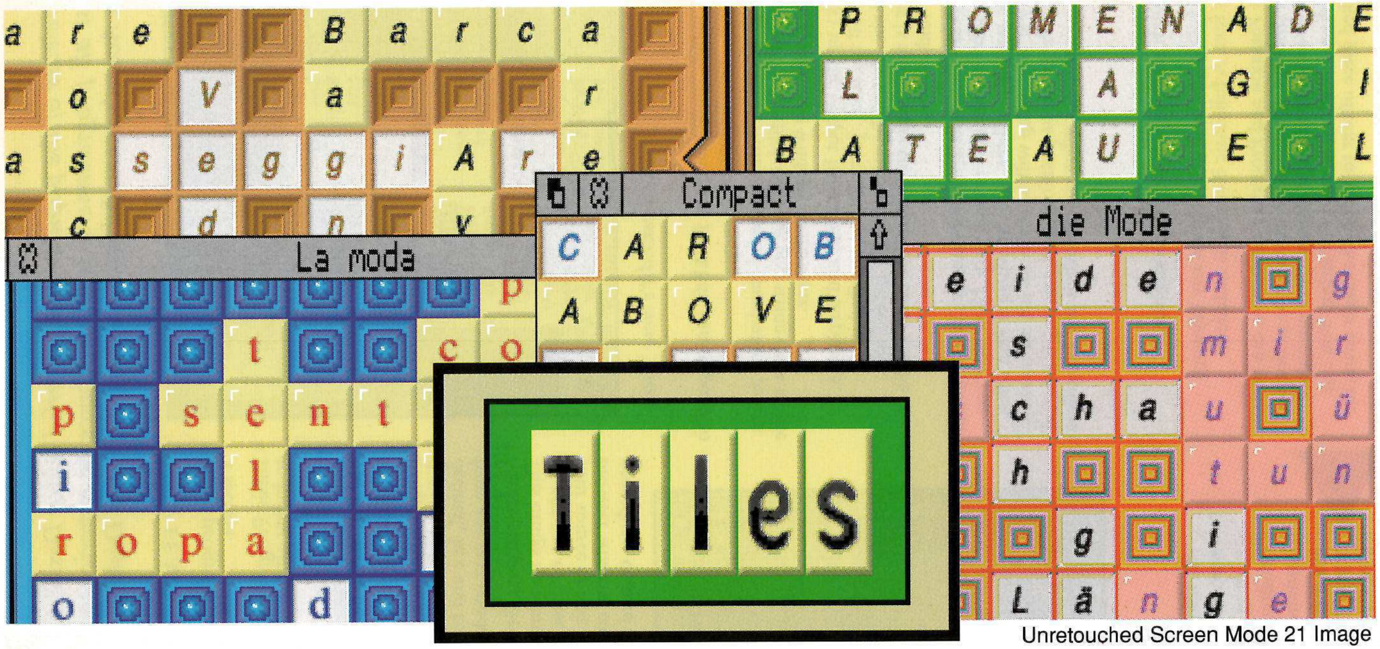
an [illegible] ord
Ali [illegible] to ma

RIS [illegible] Devel



Unretouched Screen Mode 21 Image

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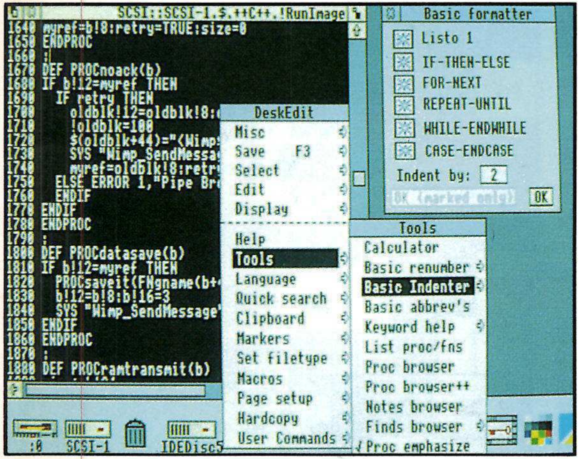
THE BEST PROGRAM AND TEXT EDITOR FOR THE ARC
HAS JUST GOT A LOT BETTER

NEW DeskEdit 2

A major new release of the popular and powerful editor DeskEdit brings a whole toolkit of features that will assist all programmers, whether novice or experienced, and whether using Basic or C - and all within Acorn's powerful multi-tasking RISC OS Desktop. There is a lot for text users too.



```
1640 myref=b!8:retry=TRUE:size=0
1650 ENDPROC
1660 :
1670 DEF PROCnoack(b)
1680 IF b!12=myref THEN
1690   IF retry THEN
1700     oldblk!12=oldblk!8:(
1710     !oldblk=100
1720     $(oldblk+44)="<Wimp$
1730     SYS "Wimp_SendMessa
1740     myref=oldblk!8:retr
1750   ELSE ERROR 1,"Pipe Br
1760   ENDIF
1770 ENDIF
1780 ENDPROC
1790 :
1800 DEF PROCdatasave(b)
1810 IF b!12=myref THEN
1820   PROCsaveit(FNgname(b+
1830   b!12=b!8:b!16=3
1840   SYS "Wimp_SendMessage'
1850 ENDIF
1860 ENDPROC
1870 :
1880 DEF PROCramtransmit(b)
```

Using DeskEdit's new Tools

NEW FEATURES INCLUDE:

- **Basic program Renumber** - and for a partial renumber, just mark a section.
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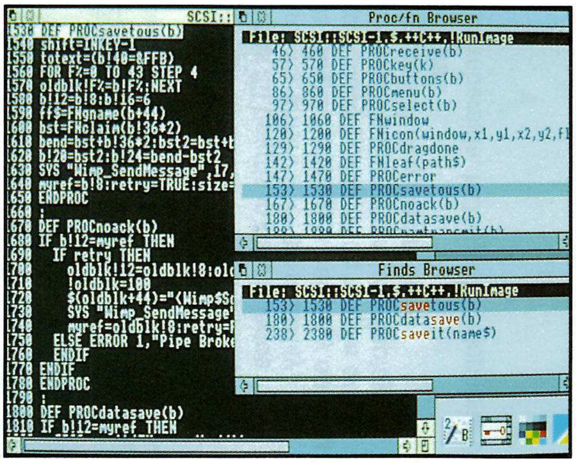
- **Basic Abbreviations** - all Basic V's several hundred abbreviations are implemented (optionally). Just type P. and if you are in Basic it will change into the keyword PRINT.
- **Programmer's Calculator** - a powerful calculator especially designed for handling bits and bytes. Simultaneously operates in decimal, hex and binary, and can import and export results to and from any text window.
- **Multi-purpose Browsers** - Press F2, and enter a search string. This brings up a browser window containing a list of finds. Click on any one of these and you are taken to the corresponding place in your source or text file. Alternatively Shift-F2 puts up a new browser window containing a list of all the functions and procedures defined in your source.



```
1530 DEF PROCsavetous(b)
1540 shift=INKEY-1
1550 totext=(b!40=&FFB)
1560 FOR F%=0 TO 43 STEP 4
1570 oldblk!F%=b!F%:NEXT
1580 b!12=b!8:b!16=6
1590 ff$=FNgname(b+44)
1600 bst=FNclaim(b!36*2)
1610 bend=bst+b!36*2:bst2=bst+b
1620 b!20=bst2:b!24=bend-bst2
1630 SYS "Wimp_SendMessage",17,
1640 myref=b!8:retry=TRUE:size=
1650 ENDPROC
1660 :
1670 DEF PROCnoack(b)
1680 IF b!12=myref THEN
1690   IF retry THEN
1700     oldblk!12=oldblk!8:old
1710     !oldblk=100
1720     $(oldblk+44)="<Wimp$Sc
1730     SYS "Wimp_SendMessage'
1740     myref=oldblk!8:retry=F
1750   ELSE ERROR 1,"Pipe Broke
1760   ENDIF
1770 ENDIF
1780 ENDPROC
1790 :
1800 DEF PROCdatasave(b)
1810 IF b!12=myref THEN
```

```
File: SCSI::SCSI-1.$.++C++.!RunImage
   46) 460 DEF PROCreceive(b)
   57) 570 DEF PROCkey(k)
   65) 650 DEF PROCbuttons(b)
   86) 860 DEF PROCmenu(b)
   97) 970 DEF PROCselect(b)
  106) 1060 DEF FNwindow
  120) 1200 DEF FNicon(window,x1,y1,x2,y2,f1
  129) 1290 DEF PROCdragdone
  142) 1420 DEF FNleaf(path$)
  147) 1470 DEF PROCerror
  153) 1530 DEF PROCsavetous(b)
  167) 1670 DEF PROCnoack(b)
  180) 1800 DEF PROCdatasave(b)
```

```
File: SCSI::SCSI-1.$.++C++.!RunImage
  153) 1530 DEF PROCsavetous(b)
  180) 1800 DEF PROCdatasave(b)
  238) 2380 DEF PROCsaveit(name$)
```

The new Browsers in use

- **Throwback** is fully implemented so DeskEdit can respond to messages from C compilers etc.
- **!FIND** - DeskEdit comes with a powerful stand-alone Acorn application called *Find*, which can find text strings in a whole group of files, just given a wildcarded filename.

  DeskEdit picks up the output from *Find*, and displays a window with all the finds. Just click on any find in the window, and the file will be automatically loaded into DeskEdit (if it is not already there), and the caret will be placed at the find.
- **Extended Saves** - DeskEdit 2 will (optionally) save a special data file each time you make a normal save. Next time you load your file, not only will the caret be where it was when you saved it, but wordwrap will be correctly set, all markers will be set to their previous positions, and pressing Undo will actually take you through what you did when you last edited your file!

And there is much more that is new in DeskEdit 2.

A new Keyword Help can now give help on any keyword marked in your text. A full Basic Help file is included.

The first line of Function and Procedure definitions can be highlighted in a printout. QuickSearch can now be performed backwards as well as forwards, and can also find procedure and function definitions which match your string. You can even use a marked piece of text to supply the target string for a Quicksearch.

Shift-Delete deletes to the end of a line, Ctrl-Delete deletes to the start of a line, and Shift-Ctrl-Delete deletes left and appends [illegible] the line above. Shift-Backspace performs [illegible] int[illegible] [illegible]-delete. There are new tabbing options etc. [illegible] ke editing fast and efficient.

All this of course is in addition to the features that have made DeskEdit so popular among users of Acorn machines, and which resulted in glowing reviews when it was first launched a year ago.

IN FACT DESKEDIT IS SO GOOD THAT IT IS USED WITHIN ACORN ITSELF.

DeskEdit 2 includes disc, new manual, keystrip and quick reference card.

PDE2b	£26.95 inc VAT + £2 p&p
PDEXa	£9.95 inc VAT + £2 p&p (upgrade*)

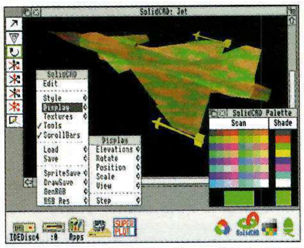
* Return original disc with order to:

[illegible]ents Ltd. 117 Hatfield Road, St Albans, Herts AL1 4JS

SILICON VISION

DESKTOP SOLUTIONS FROM THE PROFESSIONALS

SolidCAD ® Release 5.0

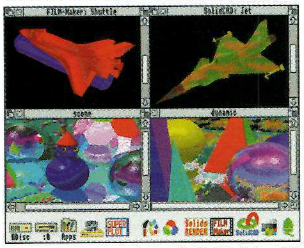


The most comprehensive 3D CAD package available for RISC OS. It is capable of generating the fastest 3D Rendering for any design. The Jet Fighter image above was rendered in less than 2 seconds. Includes a 3D Design Editor for drawing in Plan, Side, and Front Elevations, Texture Mapping, Printer & Plotter Drivers, 24 bit RGB output for the highest quality images, and a Realtime Graphics Language for the fastest programmable animation.

"very easy to use and extremely well documented if you get stuck" - Acorn Computing.

£99.95

SolidTOOLS ® Release 5.0

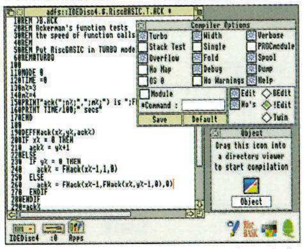


The first fully integrated environment for 3D CAD, Photo-realistic Rendering, Interactive animation, Texture mapping, Programmable animation, 24 bit RGB output and high resolution hardcopy to printers and plotters. The system provides 3D CAD facilities for Architectural, Engineering, Interior design and Teaching CDT using the industry standard 3rd Angle projection for drawing in Elevations. The package includes SolidCAD®, FilmMAKER®, and SolidsRENDER® offering a turnkey solution satisfying all your conceptual design, and presentation requirements.

"Puts Silicon Vision at the Top of the CAD market" - Archimedes World.

£275

RiscBASIC ™ Release 3.0



```
10REM >B.ACK
20REM Ackerman's function tests
30REM the speed of function calls
40REM
50REM Put RiscBASIC in TURBO mode
60REM#TURBO
100
110MODE 0
120TIME =0
130n%=3
140m%=4
150PRINT"ack(";n%;",";m%;") is ";F
160PRINT TIME/100;" secs"
170END
180
190DEFFNack(x%,y%,ack%)
200IF x% = 0 THEN
210  ack% = y%+1
220ELSE
230  IF y% = 0 THEN
240    ack% = FNack(x%-1,1,0)
250  ELSE
260    ack% = FNack(x%-1,FNack(x%,y%-1,0),0)
270  ENDIF
280ENDIF
290=ack%
```

☑ Turbo ☑ Width ☑ Verbose
☐ Stack Test ☐ Single ☐ PROCmodule
☑ Overflow ☑ Fold ☑ Spool
☐ No Map ☑ Debug ☑ Dump
☐ OS 0 ☐ No Warnings ☑ Help
☐ Module
*Command :
☑ Edit ○ BEdit
☑ No's ● !Edit
○ Twin

Drag this icon into a directory viewer to start compilation

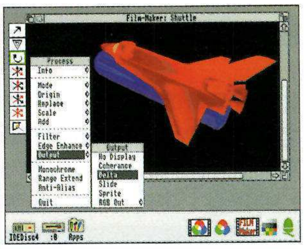
The complete software development system for producing sophisticated RISC OS applications. The unrivalled RiscBASIC compiler allows you to use the interactive development environment of interpreted BASIC for fast prototyping and interactive testing followed by source code security and the fastest machine code performance of final compilation.

"If you are looking for THE compiler to go for, and are confused about which one deserves to win the very public battle that has been raging in the advertisements, well my preference is for RiscBASIC" - RISC USER.

"Produced significantly more efficient code" - Acorn Computing

£99.95

FilmMAKER ® Release 5.0

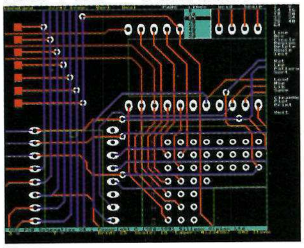


The complete Interactive 3D Animation System. Ideal for users who wish to explore their creative talents without resorting to programming. FilmMAKER® boasts the fastest frame rendering rates, less than 2 seconds/frame for the Space Shuttle, and the smoothest flicker-free playback for animating your masterpiece. Fully compatible with SolidCAD® for designs & SolidsRENDER® for ray tracing, animation Oscars are now within your reach.

"Specifying the movements of objects is a dream" - BBC Acorn User.

£79.95

ARC-PCB ™ Schematics v4.1

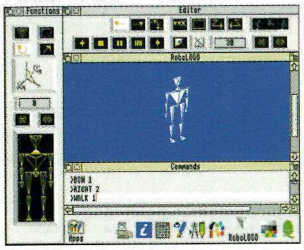


The most comprehensive Electronic Design Automation tools available for RISC OS. The range starts at ARC-PCB v1.7 for purely Digital PCB layout, graduating to ARC-PCB Professional v3.1 for combined Analogue/Digital PCB layout and ultimately to ARC-PCB Schematics v4.1 providing both Circuit Schematic drawing and all PCB layout features in one design interface. All versions include, Automatic Routing, Multiple layers, Component pulling, On-line Help, Drivers for Printers & Plotters, and up to 300,000 components. GerberPLOT & ExcellonDRILL options are £75 each.

"Performs up to professional standards." - BBC Acorn User.

£125 (v1.7), £275 (v3.1), £375 (v4.1)

RoboLOGO ™ Release 1.1



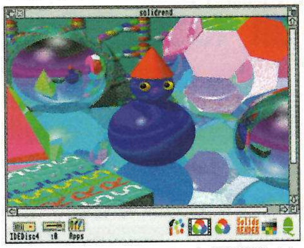
```
>BOW 1
>RIGHT 2
>WALK 1
```

RoboLOGO provides the ideal introduction to computing. This new extension to traditional LOGO provides three dimensional control of an articulated humanoid or animal figure based on the standard LOGO language. Natural commands such as 'Walking', 'Bowing', and 'Picking', etc are automatically represented graphically by natural movements of the 3D figure which is readily understood by students. The traditional Turtlegraphics and 3D Glider features are also supported for students to explore their school work further.

"Takes Turtlegraphics and LOGO into a new dimension" - Educational Computing.

£49.95

SolidsRENDER ® Release 5.0

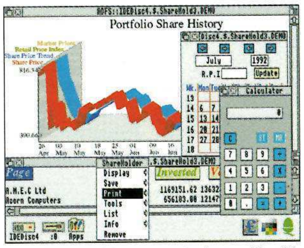


The most advanced Ray Tracing package for RISC OS. It includes a unique Accelerated ray-tracing capability for the fastest Photo-realistic rendering possible. Use standalone or import SolidCAD® designs and FilmMAKER® flightpaths for Object orientated design and Animation capabilities. SolidsRENDER® also provides the most comprehensive object properties. Why wait hours when you can now produce better results in a fraction of the time.

"the fastest ray-tracer...outputting the highest quality images" - Archimedes World.

£99.95

Shareholder ™ Release 3.0

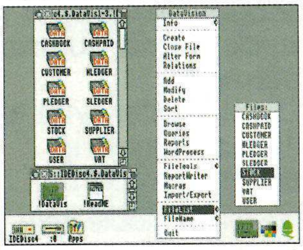


The complete share holder management systems providing all the facilities needed to automate your portfolio available in two versions. ShareHolder v2.0 features include Company statistics, Share holdings, Transaction processing, Portfolio history, Forecasts, Dividends due, Share price updates, built-in Calculator, Calendar and Hardcopy facilities for total integration. ShareHolder Professional v3.0 also includes Share trends, Retail Price index, General Market Prices and links to CEEFAX, ORACLE & PRESTEL.

"An excellent concept, the first professional share related package ... well thought through ... remarkably comprehensive" - Archimedes World.

£125 (v2.0), £275 (v3.0)

DataVISION ™ Release 1.3



The only true relational database management system available for RISC OS. Capable of performing relational updating of databases as well as the usual relational reporting features. This is all possible without resorting to programming. For advanced users a reports programming language is provided. Also includes Wordprocessing, Mailmerging, Label printing, Reports, Queries, Formula entry and Validation. Built-in security measures stop multi-tasking during relational database operations to maintain database integrity in the event of other programs crashing. Includes an accounting example to highlight DataVISION's power.

"DataVision is a good, solid relational database" - Computer Shopper.

£99.95

Free DemoPACKS ™

Full functional demo versions of all software with documentation are available on request for your evaluation. For your free DemoPACK simply send a Stamped Addressed Envelope (12"x8.5") with 54p prepaid postage per DemoPACK for the UK. Overseas requests should enquire for our local distributors.

All prices include VAT & Carriage. Access, Visa, Eurocard, MasterCard & American Express accepted.

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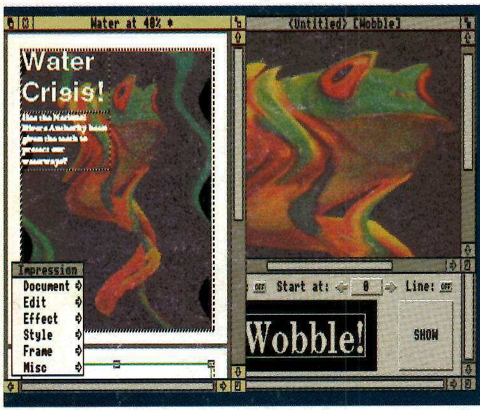
imagery

Picture Publishing for all RISC OS Computers

Design and print professionals Palette Studio have created a new image creation tool which is fully RISC OS compliant and which uses the familiar Desktop menus and dialogue boxes for all its operations. This means that anyone now using Paint will immediately feel at home.



Imagery takes over where Acorn's Paint leaves off, providing advanced 256 colour painting and image processing while supporting outline fonts, RISC OS printer drivers and inter application data transfer.

It's easy to use !Paint, !Draw and Imagery side by side or indeed Imagery and scanner software or a DTP package such as Impression, Ovation, or !DTP

Imagery contains a wide array of tools for creating artwork from scratch and many functions for processing existing pictures captured by digitisers or scanners. The Imagery product consists of the following:

- Program disc
- Manual - 64 pages minimum,
- Quick Guide, Tutorial,
- Reference,
- Colour poster with tutorial
- Function key strip
- Registration card.

Imagery is available now. You can pay by cheque/credit card which will only be cashed on despatch of your order.
Imagery is competitively priced at £89.95 including VAT and P&P.

Get the best out of your Scanner or Digitiser with Imagery, the picture publisher for RISC OS computers.

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Unit 6C/6D
Belgic Square
Peterborough
PE1 5XF
Tel: 0733 344245

Palette Studio

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